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FINAL BENTHIC INVERTEBRATE EVALUATION SOLID WASTE MANAGEMENT UNIT 3  
(SWMU3) PIER 10 SANDBLAST YARD JEB LITTLE CREEK VA  
12/1/2012  
CH2M HILL

Final

**Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard**

Joint Expeditionary Base Little Creek  
Virginia Beach, Virginia



Prepared for

**Department of the Navy**

**Naval Facilities Engineering Command  
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Prepared by

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# Benthic Invertebrate Evaluation, SWMU 3 – Pier 10 Sandblast Yard, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

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## 1.0 Introduction

This technical memorandum (TM) summarizes the field activities, analytical results, and data evaluation of the benthic invertebrate investigation at Solid Waste Management Unit (SWMU) 3, the Pier 10 Sandblast Yard, at Joint Expeditionary Base (JEB) Little Creek, Virginia Beach, Virginia. The investigation activities were performed to evaluate the condition of the existing benthic invertebrate community to help define the remediation area, evaluate remedial alternative effectiveness, and measure the achievement of remedial action objectives (RAOs). This TM was prepared for the Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under the Comprehensive Long-term Environmental Action – Navy (CLEAN) Contract N62470-08-D-1000, Contract Task Order WE07, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan.

Sections 2 through 4 of this TM provide site background information and a summary of site evaluation history. Section 5 provides a summary of the benthic invertebrate evaluation. Section 6 presents the conclusions and recommendations, and Section 7 includes the references. Attachments A, B, and C, respectively, provide the analytical data, data validation reports, and the benthic report. The complete ecological risk evaluation is contained in Attachment D.

## 2.0 Facility Background

On October 1, 2009, Hampton Roads' first Department of Defense Joint Base was established. This new installation comprises the former Naval Amphibious Base Little Creek and the Army post of Fort Story; its new name is JEB Little Creek-Fort Story. With the forming of this new command, the Navy assumes responsibility for management of both properties and will now merge meetings regarding its ongoing Environmental Restoration Programs (ERPs). However, separate records will be maintained to ensure the integrity of ongoing efforts at both properties. When required for public notices and distributions, the former bases will be identified as JEB Little Creek-Fort Story. For ERP documents, the bases will be referred to separately as JEB Little Creek and JEB Fort Story.

JEB Little Creek is primarily an industrial and training facility located in the northwest corner of Virginia Beach, Virginia (**Figure 1**). It provides logistic facilities and support services for local commands, organizations, homeported ships, and other United States (U.S.) and allied units to meet the amphibious warfare training requirements of the U.S. Armed Forces.

The 2,215-acre base is low-lying and relatively flat, with several freshwater lakes (Chubb Lake, Lake Bradford, Little Creek Reservoir/Lake Smith, and Lake Whitehurst) on or adjacent to the Base. JEB Little Creek centers around four saltwater bodies: Little Creek Harbor, Little Creek Cove, Desert Cove, and Little Creek Channel, which connects the coves and harbor with the Chesapeake Bay. Land development surrounding the Base is residential,

commercial, and industrial. Little Creek Reservoir/Lake Smith, located upgradient of the Base, serves as a secondary drinking water supply for parts of the city of Norfolk.

JEB Little Creek was placed on the National Priorities List in May 1999 (U.S. Environmental Protection Agency [USEPA] ID #VA5170022482). The Federal Facilities Agreement for JEB Little Creek was signed in November 2003 (Navy, 2003).

## 3.0 SWMU 3 Description and History

### 3.1 Historic Site Use

SWMU 3, the Pier 10 Sandblast Yard, is located in a developed area on Little Creek Harbor's western side (**Figure 2**). SWMU 3 was used for sandblasting boats between 1962 and 1984 (RGH, 1984). Sandblasting activities took place on a 0.04-acre concrete pad located to the west of Building 1263. After 1984, anchors and chains were sandblasted on the concrete pad. The used sandblast material was periodically sampled using extraction procedure toxicity testing protocols and removed from the site for disposal. Results of these toxicity tests indicated the sandblast residue was not hazardous. Paint chips and blast grit covered the unpaved ground south of the pad to the water's edge and the near-shore bottom of Little Creek Harbor. In 1982, a fence was installed around the sandblasting area to limit access to the site and prevent windblown sandblast materials from migrating outside the fenced area. In 1995, the concrete pad was taken out of service, and a new sandblasting area was constructed in the northwestern corner of the site. The new sandblasting area consisted of a 0.4-acre concrete pad surrounded by a 4- to 5-foot-high concrete wall. All sandblasting operations at SWMU 3 ceased in 1996 when the new indoor sandblasting facility, CB125, adjacent to SWMU 7b, was completed.

Historical releases from SWMU 3 likely occurred when sandblasting residue was lying directly on the ground surface. Prior to 1993, runoff from sandblasting operations occurred as sheet flow to Little Creek Harbor. In 1993, a catch basin connected to a Virginia Pollution Discharge Elimination System (VPDES)-permitted outfall was constructed. Surface drainage from the more recent sandblasting area flowed to this catch basin and emptied into Little Creek Harbor via Virginia Department of Environmental Quality (VDEQ)-permitted Outfall 008 (Permit Number VA0079928), located under Pier 10, about 35 feet from its easternmost edge. Under the VDEQ permit, Outfall 008 has no monitoring requirements. Some runoff from other areas of SWMU 3 may continue to flow directly into Little Creek Harbor. Currently, residual abrasive blast material (ABM) is present on the unpaved ground surface south of the concrete pad to the water's edge and in Little Creek Harbor sediment in the vicinity of Pier 10, the recreational marina, and south to Pier 8. **Figure 3** displays the conceptual site model for SWMU 3.

### 3.2 Current Site Use

Most of the aquatic activities within the SWMU 3 boundary are associated with the Pier 10 dry dock area and the recreational marina. The Pier 10 dry dock area of Little Creek Harbor is used for dive team training and boat maintenance. Boats are brought, with the assistance of a tug boat, to the Pier 10 dry dock for maintenance. Once boats are secured, water is removed from the dry dock at approximately 2,000 gallons per minute using ballast pumps. During these activities, sediments are disturbed; therefore, vertical mixing of the sediment in this area is likely. The recreational marina is used by military dependents and former active-duty members. Personal watercraft docked at the marina may cause minimal vertical mixing in the sediment. Substantial mixing is unlikely since the marina area is a "no wake" zone for boaters. A fueling station and fish-cleaning station are located south of the boat slips. For security purposes, recreational swimming, fishing, and crabbing are not permitted in Little Creek Harbor.

### 3.3 Dredging History

Dredging maintenance activities vary within the vicinity of SWMU 3. Little Creek Channel (not including the near-shore sediments that make up a part of SWMU 3) is maintained by U.S. Army Corps of Engineers and has been regularly dredged since 1928 to maintain a depth of approximately 27 feet below mean low water (mlw) (**Figure 2**). The surrounding area is maintained by JEB Little Creek to depths ranging from approximately 18 to 31 feet below mlw plus a 1-foot over-dredge. In 1965, the areas around Piers 1 through 8, south of the



recreational marina (just southwest of the Pier 10 dry dock), were dredged to 18 feet below mlw plus a 2-foot over-dredge. In 1999, 2 to 5 feet of sediment were removed from beneath the Pier 10 dry dock, to a depth of approximately 31 feet below mlw plus a 1-foot over-dredge. Some minor sediment removal also occurred in the vicinity of the floating dry dock at Pier 10 just prior to the start of the Remedial Investigation (RI) sampling (Fall 2002). The recreational marina area is permitted for a dredge depth of approximately 10 feet below mlw plus a 1-foot over-dredge; however, this area has not been dredged since 1965.

### 3.4 Human Health Risk Summary

A baseline Human Health Risk Assessment (HHRA) was conducted for SWMU 3 as part of the RI (CH2M HILL, 2005) and Supplemental RI (CH2M HILL, 2009a). Reasonable maximum exposure non-cancer hazards and cancer risks associated with current and future human exposure to site sediment and surface water were below or within the USEPA acceptable levels. The Navy, USEPA, and VDEQ agreed there is no unacceptable human health risks associated with exposure to sediment or surface water.

### 3.5 Ecological Risk Summary

A Screening Ecological Risk Assessment (SERA), constituting Steps 1 and 2 of the Ecological Risk Assessment (ERA) process, and the first step (Step 3A) of a baseline ERA were conducted for SWMU 3 as part of the RI (CH2M HILL, 2005). Based on the results of the ERA, the Navy, USEPA, and VDEQ agreed there are no unacceptable ecological risks associated with direct or indirect exposure to surface water. However, a comparison of sediment data to screening values, along with the evaluation of near shore benthic community survey data in the ERA, indicated that ABM-related constituents (copper, lead, nickel, tin, and zinc) from the site, as well as mercury and polycyclic aromatic hydrocarbons (PAHs), may have adversely affected ecological receptors (primarily the benthic invertebrate community) in the portions of Little Creek Harbor adjacent to SWMU 3.

A revised ERA was conducted as part of a Supplemental RI to define the spatial limits (lateral and vertical) of ABM and to determine if there is a correlation between metals and ABM in sediment (CH2M HILL, 2009). The revised ERA concluded ABM was significantly correlated with copper, lead, nickel, tin, and zinc in surface sediments and is a good indicator of site influence for defining the spatial extent of contamination. Although commonly used as an anti-fouling agent in marine paints, mercury concentrations detected in sediment were not correlated with ABM content, and concentrations potentially posing risk were spatially limited. PAHs were detected in sediment across the site at concentrations potentially contributing to unacceptable risk; however, these are not associated with historical sandblasting activities and are therefore not considered a result of a CERCLA release.

### 3.6 Identification of Remedial Action Objectives

The revised ERA recommended that RAOs be established for sediment and that preliminary remediation goals (PRGs) be developed for the five ABM-related constituents of concern (COCs) (copper, lead, nickel, tin, and zinc) based on the extent of ABM, risk-based screening values from available literature, and comparison to urban background levels. The revised ERA also recommended that mercury and PAHs be considered as secondary factors based upon their lack of correlation with ABM and poor spatial linkage to SWMU 3. As a result, the following preliminary RAO was drafted for sediment:

- Remove ABM-containing sediments and associated metals from the site to the greatest extent practicable to allow a benthic invertebrate community consistent with the urban nature of Little Creek Harbor to become established.

### 3.7 Development of Preliminary Remediation Goals

To meet the preliminary RAO, ABM (based upon visual observation) and metals-based PRGs were established. As part of the Supplemental RI, simple linear regression was used to investigate potential correlations between the metals concentrations in surface sediments and the amount of ABM present. All surface sediment samples from 2002 and 2007 for which ABM content was quantified were used in the analysis. The 2002 and 2007 surface sediment data indicate a relatively strong (and statistically significant) positive correlation between the ABM content in surface sediment samples and the concentrations of copper, lead, nickel, tin, and zinc. The resulting

regression equations were used to calculate associated sediment concentrations using 1 percent ABM (the lowest possible integer; also, percent ABM in sediment was only estimated to the nearest integer during the 2007 SRI sampling). These values, along with consideration of site-specific background concentrations and literature-based sediment effect levels (effects range-low [ER-L], effects range-median [ER-M], threshold effects level [TEL], and probable effects level [PEL]), were used to define the sediment PRGs for the five primary COCs (**Table 1**). The PRGs for copper, lead, and tin were based upon the regression equations (at 1 percent ABM); none of these PRGs exceeded the ER-M (where available) and all were reasonably comparable to the maximum background concentration. The PRG for nickel was set at the maximum background concentration because maximum background exceeded the regression-derived value and was below the ER-M. For zinc, the ER-M was selected as the PRG because the regression-derived value exceeded all effects-based criteria. It should be noted, however, the maximum background value for zinc also exceeded the ER-M. In addition to the PRGs for the primary COCs, a PRG for ABM content in sediment was established at equal to or less than 1 percent, based on visual observation.

### 3.8 Delineation of Lateral and Vertical Extent Boundary

In 2009, following the development of PRGs, available surface sediment data were used to preliminarily define lateral extent of impacted sediment. In conjunction with ABM content, a remediation quotient (RQ) for the ABM-related COC PRGs was calculated. The RQ is defined as the ratio of the PRG to the sediment concentration. A sample location was considered “impacted” if: (1) ABM is present at greater than 1 percent and (2) the average RQ for the five COCs exceeds 1.0 or if the RQ for one or more individual COCs exceeds 1.5. In November 2009, additional sediment sampling was conducted to define the vertical extent. To perform the vertical delineation, the site was divided into a 100-foot-by-100-foot grid system. Sediment cores were collected from within each grid sector located within the lateral boundary and the maximum vertical extent of ABM (greater than 1 percent) was visually identified. A 6-inch vertical sample was then taken from the sediment core just below this ABM-defined depth and analyzed for the metal COCs. If the RQ criteria were met in this sample, no additional samples at deeper depths were analyzed. As documented in the final, approved SAP (CH2M HILL, 2009b), the vertical extent was defined as the shallowest depth at which the RQs were below established criteria. Following the November 2009 sampling event, the boundary was refined to include all “impacted” grid sectors as previously defined. The preliminary 2009 lateral and vertical boundary of potentially impacted sediment, as defined utilizing data collected as of November 2009, encompasses an area of approximately 13.3 acres and consists of approximately 61,266 cubic yards of sediment (**Figure 2**).

### 3.9 Review of Remedial Alternatives

During development of a feasibility study (FS) for SWMU 3, remedial alternatives and their overall effectiveness in reducing site-wide risk were evaluated, as well as engineering restraints and upcoming military construction (MILCON) and dry dock maintenance activities. Results of the preliminary FS evaluation indicated that the largest reduction in risk (based upon the 2009 evaluation criteria for ABM and RQ) would be accomplished through remediation of the rip-rap area along the southern shoreline of the site, with minimal additional risk reduction recognized as costs significantly increased under the remaining scenarios (which also considered offshore areas and the marina). As a result of this evaluation, the JEB Little Creek Partnering Team discussed the need for additional information regarding the current condition of the benthic invertebrate community for determining remedial alternative effectiveness and measuring long-term achievement of the preliminary RAO (establishment of a benthic community).

## 4.0 Project Objectives and 2010 Field Investigation Activities

### 4.1 Objectives for the 2010 Benthic Invertebrate Investigation

Following the preliminary evaluation of remedial alternatives, the JEB Little Creek Tier I Partnering Team agreed additional information was required to evaluate the overall effectiveness of a remedy with respect to achievement of the previously identified preliminary RAO through establishment of a benthic community within SWMU 3. Therefore, the primary objective for benthic invertebrate sampling at SWMU 3 was to evaluate the

current condition of the benthic invertebrate community within the 2009 preliminary impacted sediment lateral boundary to support the evaluation of remedial alternatives and assist in measuring remedy success against the preliminary RAO. The environmental questions to be answered were:

- What is the composition and condition of the existing benthic invertebrate community at SWMU 3 and how does it vary spatially throughout the site?
- Is the composition and condition of the existing benthic invertebrate community at SWMU 3 correlated with the concentration of the COCs and/or the presence of ABM?

Due to scheduled maintenance of the Dry Dock in 2012, an Engineering Evaluation/Cost Analysis (EE/CA) was to be prepared for completion of a non-time-critical removal action (NTCRA) in the northern portion of the site and the area surrounding the Dry Dock. Therefore, a third environmental question was also included in the SAP as follows:

- What is the site condition following completion of the NTCRA, and what action is required at SWMU 3 to meet the RAO and what is the spatial extent of such an action?

Following additional Team discussion, it was agreed the site would be addressed as a whole under the completion of a FS, Proposed Plan, and Record of Decision; therefore, a NTCRA will not be completed. Thus, the third environmental question has been modified as follows:

- What action is required at SWMU 3 to meet the preliminary RAO and what is the spatial extent of such an action?

These environmental questions are evaluated in Section 5 and Attachment D.

## 4.2 2010 Benthic Invertebrate Field Investigation Activities

Benthic invertebrate evaluation sediment sampling was conducted in August and September 2010, in accordance with the *Final SWMU 3 – Pier 10 Sandblast Yard and SWMU 7b – Desert Cove Benthic Invertebrate Sediment Sampling Work Plan and Sampling and Analysis Plan* (CH2M HILL, 2011), to meet the previously outlined project quality objectives. Composite surface sediment samples were collected at 60 stations within Little Creek Harbor from 0 to 6 inches below sediment surface (bss) using a 6-inch-by-6-inch petite Ponar dredge (**Table 2, Figure 4**). Where insufficient penetration or evidence of significant disturbance (such as washouts) was observed, a larger (9-inch by 9-inch) clamshell grab sampler was deployed and a 6-inch by 6-inch subset of that sample was retained.

Before samples were collected, surface water quality parameters (dissolved oxygen [DO], oxidation-reduction potential [ORP], pH, temperature, conductivity, turbidity, and salinity) were collected from the top, middle, and bottom of the water column at each sample location using a YSI water quality meter (**Table 3**). Two surface sediment grab samples were collected from 3 locations (6 total) surrounding each of the 60 sample stations. While still in the Ponar sampler, each grab sample was examined for an oxidation-reduction (redox) boundary (**Table 3**). Sediment from one grab sample was placed directly in a sample container for Acid Volatile Sulfide/Simultaneously Extracted Metals (AVS/SEM) analysis. One grab sample from each location was designated for estimating ABM content and analytical sample collection and was placed in a disposable aluminum pan for homogenization. Following sample homogenization, ABM content was estimated using approximately 250 milliliters (ml) of the composited sediment. Fines were decanted from the sample, and the percent volume of ABM was visually estimated. Following visual examination, 60 composite surface sediment samples were collected and analyzed for select metals (copper, lead, nickel, tin, and zinc), total organic carbon (TOC), pH, grain size, and AVS/SEM.

The second grab sample from each location was designated for benthic invertebrate sieving and was placed directly into a 500-micrometer mesh sieve bucket. Benthic invertebrate grab samples surrounding 3 of the 60 sample stations were evaluated separately as replicate samples. Sediment reserved in the sieve bucket was gently washed with site water to remove fine-grained material. Material remaining on the sieve was rinsed with site water into 2,000-ml polyethylene sample containers. To allow for an adequate volume of preservative to be added, each container was only half filled with the sieved material. Additional site water and approximately

200 ml of buffered formalin was added to each sample. A cardstock label was placed inside each container, and the sample was capped and gently shaken to ensure even distribution of the preservative. Sixty-six (57 composite and 9 replicate) samples were collected for benthic invertebrate enumeration.

Excess surface sediments were returned to the water body. Disposable sampling equipment was rinsed with site water before disposal as solid waste. All non-disposable equipment, such as the Ponar dredge, was rinsed with site water between sample locations.

## 4.3 Data Management and Evaluation

Data management and tracking, from the time of field collection to receipt of validated electronic analytical results, is of primary importance and reflects the overall quality of analytical results. Field samples and their corresponding analytical tests were recorded on chain-of-custody forms, which were submitted with the samples to the offsite laboratory. Chain-of-custody entries were checked against the site-specific project instructions and work plans to verify that all designated field samples were collected and submitted for the appropriate analysis. Upon receipt of the samples by the laboratories, a comparison to the field information was conducted to verify that each sample was analyzed for the correct parameters and appropriate quality assurance/quality control (QA/QC) samples were collected.

### 4.3.1 Data Qualifiers

Analytical data reports for sediment samples analyzed for select metals, TOC, and AVS/SEM were submitted in hardcopy and electronic format for internal data validation. Procedures used for validation were *Region III Modifications to the National Functional Guidelines for Organic Data Review, Multi-media, Multi-concentration* (USEPA, 1994) and *Region III Modifications to Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis* (USEPA, 1993). Analytical data are provided in **Attachment A**, and the data validation summaries are provided in **Attachment B**.

The data validation qualifiers, or flags, used for the data are the following:

- Data qualified with a “B” flag by the data validator indicates the analytes have also been detected in a field, equipment, or trip blank or in a laboratory QA/QC sample. The concentration of a B-qualified result is less than 10 times the concentration of the constituent for an associated QA/QC result. If the sample concentration is less than 10 times the associated blank concentration, the conclusion is that the parameter was not detected. Potential sources of blank contamination are discussed as follows.
- Data qualified with a “J” flag indicates the analyte is present, but the value is estimated.
- Data qualified with a “K” flag indicates the analyte is present, but the reported value may be biased high and the actual value is expected to be lower.
- Data qualified with an “L” flag indicates the analyte is present, but the reported value may be biased low and the actual value is expected to be higher.
- Data qualified with a “U” flag indicated the analyte was not detected above the reported laboratory detection limit.

Grain size and pH data underwent an internal QC analysis by the project chemist. Benthic invertebrate data (**Attachment C**) underwent an internal QC check by the project senior ecological risk assessor.

### 4.3.2 Comparison Criteria

#### 4.3.2.1 Laboratory and Sample Blank Contamination

In some instances, constituents detected in samples may have been introduced during field sampling, transportation to the analytical laboratory, or during laboratory procedures. A variety of blank samples were analyzed and used in the QA/QC process to determine which of the constituents may or may not have been attributed to the field sample.

Field blanks were collected to account for ambient conditions during sample collection. Equipment and rinsate blanks were collected to determine if the equipment used to collect the samples (such as Ponar dredges and sample containers) was adequately clean. In addition, the laboratory analyzed method blanks in each batch of 20 samples to verify instrument cleanliness and function. Common phthalate compounds can be introduced during the analytical process and are often considered laboratory contaminants.

To determine if a “B” qualifier should be assigned to a solid sample, a unit conversion was performed, whereby solid sample concentrations relative to laboratory blank concentrations were calculated by dividing the solid concentration by the fraction of moisture, then dividing the result by 5. When blank samples were found to contain common laboratory contaminants, each of the solid field samples associated with that blank that contained up to 10 times the concentrations in the blanks were qualified during data validation with a “B” for that compound. A “B” qualifier means that the compound may not be attributed to the site at that sample location. When a sampling or laboratory blank contained constituents other than the common laboratory contaminants, each of the solid field samples associated with that blank that contained up to 5 times the concentration was qualified during data validation with a “B” for that compound.

#### 4.3.2.2 Background Data

In June 2007, the Navy, in partnership with USEPA and VDEQ, agreed to collect background sediment samples from an urban cove area unaffected by sandblasting activities for use in developing remediation goals for SWMU 3. Following a review of historical data, the northern portion of Little Creek Cove was identified as a potentially suitable area for this purpose. Similar to SWMU 3, Little Creek Cove receives storm water runoff from various locations within the facility, including other CERCLA sites within the ER Program.

A traditional, statistically-based work plan was not developed for the collection of urban background sediment samples. In July 2007, surface sediment grab samples were collected along a series of transects and visually inspected for grain size and ABM content. Based upon these observations, eight surface sediment samples (and one field duplicate) were collected ([Figure 5](#)) and analyzed for the SWMU 3 COCs (copper, lead, mercury, nickel, tin, and zinc), TOC, pH, and grain size. Three of the samples were also analyzed for AVS/SEM. The data from this background sampling are provided in [Attachment D, Table D-1](#). The background sediment samples were broadly similar in terms of physical characteristics to site samples but tended to be higher in TOC and composed of a higher percentage of fines (silt/clay). In addition, the range of concentrations in the background sediment samples was narrow (low variability), which suggests that these samples represent urban background for this geographical area.

The approach for using these background data is documented in the UFP SAP (CH2M HILL, 2011). These data were used as one of several inputs to develop sediment PRGs for SWMU 3. A comparison of SWMU 3 COC sediment concentrations to the urban background sediment concentrations was conducted. The uncertainties associated with the use of these background data are discussed in [Attachment D, Section D.1.1.2](#).

#### 4.3.2.3 Preliminary Remediation Goals

Sediment metals results were compared to the previously established PRGs presented in [Table 1](#) to help define the lateral area for potential remediation. For each sampling grid, sediment metals results were divided by their respective PRGs to establish the associated individual COC RQ values. An average RQ value was then established for each sampling grid using the individual COC RQs.

## 5.0 Ecological Risk Evaluation Summary

This section summarizes the results of the ecological risk evaluation of the additional data collected at SWMU 3 in August and September 2010, subsequent to the revised ERA completed as part of the 2009 Supplemental RI report. The complete ecological risk evaluation is contained in [Attachment D](#). These additional data include surface sediment and benthic invertebrates systematically collected throughout the entire site. The purpose of

these additional data was to help evaluate remedial alternatives and to provide a baseline for measuring the achievement of the preliminary RAO developed for the site.

This evaluation is limited to the sediments of Little Creek Harbor adjacent to SWMU 3 and to the primary COCs identified in the 2009 Supplemental RI (copper, lead, nickel, tin, and zinc). Only the data collected in 2010 are quantitatively evaluated. As described in **Section D.1.1 of Attachment D**, there are no unacceptable ecological risks associated with the terrestrial portions of the site due to the lack of significant exposure pathways. Groundwater does not appear to be a significant transport route from the site to Little Creek Harbor for ABM-related constituents. No new surface water data have been collected from the site because no risk drivers were identified for this medium in previous assessments. The focus of this ecological risk evaluation was to address the primary objective and to answer the environmental questions previously presented.

## 5.1 Risk Characterization

The lines of evidence evaluated included a comparison of 2010 site COC surface sediment concentrations with sediment PRGs developed following completion of the 2009 Supplemental RI and a quantitative statistical evaluation of benthic invertebrate survey data collected in 2010. Sediment sample screening results are presented in **Table 4**.

### 5.1.1 Comparison with Sediment PRGs

The surface sediment evaluation was conducted using the following spatial groupings: (1) Near Shore Area; (2) Marina; (3) Dry Dock; and (4) Offshore Area (**Figure 4**). A sample meets the decision criteria relating to the sediment PRGs if: (1) visible ABM is less than or equal to 1 percent; (2) the average RQ is less than 1; and (3) no individual RQ is greater than 1.5. For all areas combined, ABM exceeded 1 percent in 24 of 58 samples (two samples did not have data for this parameter), one or both RQ criteria were exceeded in 24 of 60 samples, and both the ABM and RQ criteria were exceeded in 18 of 60 samples (**Figure 6**). However, the SEM/AVS ratio, a measure of metal bioavailability, exceeded one in only 2 of 60 samples, and only one of these two samples (SD-516, in the Near Shore Area) also failed the ABM and/or the RQ criteria (although the SEM/AVS ratio was only slightly over one [1.10] at SD-516). Fourteen benthic invertebrate taxa were observed at SD-516, with a total density of 560 organisms per square meter. Both of these values were well above the median value that was calculated across all 60 grids (**Figure 5**). Pollution sensitive taxa were also observed at SD-516 (6 total pollution sensitive organisms, among the highest totals observed at the site), comprising about 10 percent of the community. The nearby Near Shore sampling grids SD-523 and SD529, which also failed both the ABM and RQ criteria but had SEM/AVS ratios below one, had similarly high number of taxa and densities, and also contained pollution sensitive taxa.

None of the 3 samples from the Dry Dock exceeded either the ABM or the RQ criteria. The average percent ABM in the Dry Dock samples was 0.67 and the mean average RQ was 0.76. The lack of exceedances is likely the result of dredging that has occurred in this area in 1999 and 2002. For the Marina, 7 of 11 samples failed the ABM criterion, 5 of 11 samples failed the RQ criteria, and 5 of 11 samples failed both. The average percent ABM was 2.44, and the mean average RQ was 1.10. For the Near Shore Area, 11 of 19 samples failed the ABM criterion, 10 of 19 samples failed the RQ criteria, and 9 of 19 samples failed both. The average percent ABM was 12.3, and the mean average RQ was 3.19. For the Offshore Area, 6 of 25 samples failed the ABM criterion, 9 of 27 samples failed the RQ criteria, and 4 of 27 samples failed both. The average percent ABM was 0.87, and the mean average RQ was 0.98.

### 5.1.2 Benthic Invertebrate Surveys

Benthic invertebrate surveys were conducted in 2010 at all 60 grids within the 2009 preliminary impacted sediment lateral boundary. Organism counts are noted in the bottom right corner of each grid on **Figure 5**. During the 2010 sampling, organism counts were highly variable but most locations had low numbers of organisms. Of the 60 grids sampled, 14 (23.3 percent) had zero organisms (for each of the three grids [534, 550, and 558] that had replicate samples, at least one replicate had no organisms; however, the average of the three replicates was used to represent the grid, so none of these grids was considered to have no organisms) and 33 (55 percent) had

fewer than 10 total organisms. Total densities ranged from 0 to 2,414 organisms per square meter, and number of taxa ranged from 0 to 35. The benthic invertebrate community at the site was dominated by polychaetes, most of which are pollution tolerant. Polychaetes accounted for about 52 percent of the total benthic invertebrate community. Bivalves, the next most numerous group, comprised about 21 percent of the total community. Pollution sensitive organisms were detected in some samples, but were relatively uncommon. About half (31 of 60) of the sampling grids (including the 14 grids with no total organisms) had no pollution sensitive organisms and only 6 grids had more than 5 total pollution sensitive organisms (5 of these 6 grids were in the Near Shore Area).

### 5.1.3 Correlation Between Benthic Metrics and Physical/Chemical Parameters

In Section 4.1, the following environmental question was outlined:

- Is the composition and condition of the existing benthic invertebrate community at SWMU 3 correlated with the concentration of the COCs and/or the presence of ABM?

In this subsection, a statistical evaluation of the 2010 benthic invertebrate data is conducted in order to answer this question.

As outlined in the Sampling and Analysis Plan (SAP), a statistical evaluation of the 2010 benthic invertebrate survey data was to be conducted using the following 10 metrics: (1) number of taxa (taxa richness); (2) total density; (3) percent contribution of the dominant taxon; (4) density of the dominant taxon; (5) percent Spionid polychaetes; (6) percent *Mediomastus* and *Capitella* polychaetes; (7) density of pollution tolerant organisms; (8) percent pollution tolerant organisms; (9) density of pollution sensitive organisms; and (10) percent pollution sensitive organisms. However, because of the relatively large number of sampling grids with zero organisms (14 of 60 or 23.3 percent), only number of taxa and total density were used in the statistical evaluation. Zero counts always yield meaningful values for these metrics, which is not always true for the other eight metrics. A zero value for number of taxa and total density means that no organisms were present, a meaningful result. However, if a sample contains no organisms (and is therefore presumed to be impacted), it has an undefined value for any of the parameters based upon a percentage (since you are dividing by zero). The sample would also have a value of zero for density of the dominant taxon and density of pollution tolerant organisms; low values for these two parameter suggest a healthy, not an impacted, community. These two metrics were examined for correlations with physical and chemical parameters, including those for surface sediment, the concentrations of the COCs, average RQ, grain size, TOC, pH, SEM/AVS ratio, and percent ABM; water depth; and, for the water column (measured just above the sediment surface), DO, ORP, salinity, temperature, specific conductivity, turbidity, and pH. Both statistical and observational methods were used to identify chemical and/or physical parameters that were potentially associated (correlated) with differences in the values of the benthic invertebrate metrics.

Based upon a non-parametric test, number of taxa had 18 significant correlations (out of 25 possibilities) with the physical and chemical parameters. These correlations were relatively weak, with very few coefficient of determination ( $R^2$ ) values above 0.50 (these values indicate the proportion of the variability explained, a measure of the strength of the relationship). Total density had 19 significant correlations (out of 25 possibilities) with the physical and chemical parameters. These correlations were relatively weak, with very few  $R^2$  values above 0.50. Silt and clay had the strongest correlations (maximum  $R^2$  of 0.620), followed by water depth (maximum  $R^2$  of 0.562), bottom DO (maximum  $R^2$  of 0.342), and TOC (maximum  $R^2$  of 0.290). The metal COCs were not significantly correlated with either benthic metric (copper, nickel, and zinc) or were only weakly correlated (tin and zinc). Average RQ was also not significantly correlated with either benthic metric.

Based upon the results of the individual correlations, multiple regression analysis was conducted for number of taxa and total density. These two benthic metrics were significantly positively correlated with one another, with a  $R^2$  value of 0.956. The physical and chemical parameters (silt and clay, TOC, water depth, and bottom DO) that had the highest individual correlations with the benthic invertebrate metrics were included in the multiple regression analysis. Average RQ and percent ABM were also included because they represented the PRG decision metrics; average RQ was not significantly correlated with either benthic metric based upon the non-parametric test ( $R^2$  values of 0.019 and 0.030) and percent ABM was only weakly (but significantly) correlated ( $R^2$  values of 0.180 and 0.165).

For number of taxa, silt and clay, water depth, and average RQ were the variables that were most consistently important to the models. The resulting model containing these three variables was a relatively good predictor, with an adjusted  $R^2$  value of 0.610. Water depth, which was correlated with bottom DO, was selected preferentially by the model, although bottom DO also entered the forward model (but was not significant in the final model). Of interest, average RQ was consistently an important variable in the model even though its individual correlation to number of taxa was not significant ( $R^2$  value of 0.019,  $p=0.30$ ). Further, the sign of its contribution to the model was positive, meaning that higher values for number of taxa were associated with higher average RQ values.

For total density, silt and clay and average RQ were the variables most consistently important to the models. The resulting model containing these two variables was, however, a poor predictor, with an adjusted  $R^2$  value of 0.422. Bottom DO also entered the forward model (but was not significant in the final model). Of interest, average RQ was consistently an important variable in the model even though its individual correlation to total density was not significant ( $R^2$  value of 0.030,  $p=0.18$ ). Further, the sign of its contribution to the model was positive, meaning that higher values for total density were associated with higher average RQ values.

In summary, silt and clay and average RQ were the best predictors of the benthic invertebrate metrics, along with water depth and, to a lesser extent, bottom DO. However, average RQ was positively correlated with the metrics. Silt and clay was negatively correlated with the metrics, suggesting that depositional areas with high silt and clay content (and likely organic loading) were detrimental to the benthic invertebrate community. Water depth was also negatively correlated with the metrics, while bottom DO was positively correlated. Thus, shallower waters with less deposition had higher levels of DO, allowing a relatively “healthier” benthic invertebrate community to occur, as measured by the benthic metrics evaluated. Conversely, these areas were generally along the site shoreline and thus tended to have higher concentrations of metals and ABM, which is likely why the RQ variables were positively correlated with the benthic metrics. Based upon these data, the physical factors (such as bottom DO) had more effect on the benthic invertebrate community than the chemical factors related to the site. This may be due to limited metal bioavailability, as the SEM/AVS ratios were almost always less than one. Thus, low DO at the bottom of the water column (just above the sediment surface) appears to have a major impact on the benthic community. This condition is not uncommon in urban harbors with high organic loading in the Chesapeake Bay system, particularly in summer (July and August) when the amount of oxygen the water column can hold, which decreases as water temperature increases, is at a minimum. Freshwater inflow carrying nutrients (primarily nitrogen and phosphorus) from agricultural and urban runoff, wastewater systems, and atmospheric deposition stimulates the growth of phytoplankton/algae, which later die and sink to the bottom of the water column, where their decomposition by bacteria consumes much of the oxygen from the bottom of the water column (which is why TOC is typically negatively correlated with bottom dissolved oxygen concentrations). This process can be exasperated in deeper waters as water column stratification can develop based upon differences in water temperature and salinity (increases in salinity also reduce the amount of oxygen the water can hold) with depth, isolating the deeper waters from the more oxygenated (through diffusion with the air, wind action, and wave/tidal action) surface layers. Based upon the 2010 data, a bottom DO of 4 milligrams per liter (mg/L) is an approximate “threshold,” at the water temperature and salinity present at the time of sampling, below which impacts to the benthic invertebrate community appear to be most acute at this site. However, since water temperature, and to a lesser extent salinity, vary temporally, this “threshold” cannot be extrapolated to other periods of the year; however, it is a useful qualitative measure for the spatial evaluation of the 2010 data set.

#### 5.1.4 Spatial Analysis

In Section 4.1, the following environmental question was outlined:

- What is the composition and condition of the existing benthic invertebrate community at SWMU 3 and how does it vary spatially throughout the site?

In this section, a statistical evaluation of the 2010 benthic invertebrate data is conducted in order to answer this question.



For each benthic metric, parametric and non-parametric analysis of variance (ANOVA) was used to determine if any differences existed among 2010 area (Dry Dock, Near Shore, Marina, and Offshore) means. Number of taxa and total density showed identical spatial patterns. The highest values of these metrics were found in the Near Shore Area, followed by the Marina (which did not differ significantly from the Near Shore Area), the Offshore Area (which differed from the Near Shore Area but not the Marina), and the Dry Dock (which differed from the Near Shore Area and Marina but not the Offshore Area). Thus, total density and number of taxa were highest in the Near Shore Area and most of the Marina, were zero in the immediate vicinity of the Dry Dock, and were typically very low in the Offshore Area. This distribution does not match well with metal or ABM concentrations, suggesting that other factors (such as low DO) may be as or more important to survival of benthic invertebrates. Bottom DO exceeded 4 mg/L in most Near Shore (with two exceptions; one next to the Dry Dock and one in the southern portion of the site) and Marina grids. Bottom DO does not exceed this value in any Dry Dock grid and in about half of the Offshore Area grids. Bottom DO is also negatively correlated with water depth; the deepest water was generally observed in the Dry Dock and Offshore Areas.

Because a reference area was not sampled for benthic invertebrates, values for the two benthic invertebrate metrics used in the SWMU 3 evaluation (number of taxa and total density) were qualitatively compared among the spatial areas of the site. Values for these metrics were generally highest in the Near Shore and Marina Areas (where metals concentrations and ABM were typically highest) and lowest in the Offshore and Dry Dock Areas (where metals concentrations and ABM were typically lowest). Although the area in the vicinity of the Dry Dock has been dredged as recently as 2002, sufficient time has passed for the benthic community to become reestablished. It appears that physical factors, such as low bottom DO levels and water depth, may be preventing this from occurring since metal concentrations and ABM levels are below remediation criteria. Routine activities associated with Dry Dock activities, such as prop wash from tug boats and operation of the Dry Dock pumps, may also be a factor.

## 5.2 Risk Evaluation

In Section 4.1, the following environmental question was outlined:

- What action is required at SWMU 3 to meet the preliminary RAO and what is the spatial extent of such an action?

In this section, the results for the lines of evidence evaluated are integrated to answer this question. The other two environmental questions were evaluated in the previous two subsections.

Because a suitable reference area was not sampled, there is insufficient data to fully evaluate the preliminary RAO (to allow a benthic invertebrate community consistent with the urban nature of Little Creek Harbor to become established) since a quantitative measure of a benthic invertebrate community consistent with the urban nature of Little Creek Harbor (but unaffected by SWMU 3) is unavailable. However, the portion of the site with the highest concentrations of metals and ABM (Near Shore Area and portions of the Marina) typically has the most developed benthic invertebrate community relative to other areas of the site (Dry Dock and Offshore Areas), where metals concentrations and ABM are typically lower. This may be due to limited metal bioavailability, as the SEM/AVS ratios were almost always less than one in 2010 samples (for 58 of 60 grids). Although AVS may vary seasonally, the 2010 data, collected in late summer when DO levels are typically lowest and organisms are typically most stressed, may be the most relevant data on a seasonal basis. None of the Dry Dock samples, and very few of the Offshore Area samples, fail both the percent ABM and RQ criteria. The impacts to the benthic invertebrate community in these areas appear to be related to physical factors not associated with SWMU 3 (such as water depth and bottom DO concentrations). Since ABM is essentially inert (based upon grain size analysis, ABM appears predominantly in the coarse sand fraction; the “black beauty” materials consist mainly of silicon dioxide [sand], aluminum oxide, iron oxide, and calcium oxide) and the metals in the paint residues do not decay (since they are elements, although they may change chemical form based upon ambient environmental conditions) and increase sediment oxygen demand, these site-related factors do not contribute to reduced DO levels at the bottom of the water column. Although the current, non-CERCLA-related physical characteristics of the site (such as bottom DO concentrations) may be having more of an impact on the condition of the benthic

invertebrate community than the CERCLA-related metals detected in site sediments (due to bioavailability considerations), the magnitude of these metals concentrations may potentially result in unacceptable risks to ecological receptors should these physical characteristics change over time; therefore, remedial action at SWMU 3 is warranted. Given the current physical limitations in the Dry Dock and Offshore Areas (primarily low bottom DO concentrations), it is unlikely that a benthic invertebrate community that would approach that in a similar urban reference area would be established following remedial action; therefore, the remedial action objectives established for the site should focus on the reduction of metals concentrations and not the establishment of a comparable (to an urban reference condition) benthic invertebrate community.

## 6.0 Conclusions and Recommendations

Based upon the regression analysis, silt/clay and average RQ were the best predictors of the benthic invertebrate metrics, along with water depth and, to a lesser extent, bottom DO. However, average RQ was positively correlated with the metrics. Silt/clay was negatively correlated with the metrics, suggesting that depositional areas with high silt/clay content (and likely organic loading) were detrimental to the benthic invertebrate community. Water depth was also negatively correlated with the metrics while bottom DO was positively correlated. Thus, shallower waters with less deposition had higher levels of DO, allowing a relatively “healthier” benthic invertebrate community to occur, as measured by the benthic metrics evaluated. Conversely, these areas were generally along the site shoreline and thus tended to have higher concentrations of metals and ABM. Based upon these data, the physical factors (such as bottom DO) had more effect on the benthic invertebrate community than the chemical factors related to the site. This may be due to limited metal bioavailability as the SEM/AVS ratios were almost always less than one in 2010 samples (for 58 of 60 grids). Although AVS may vary seasonally, the 2010 data, collected in late summer when DO levels are typically lowest and organisms are typically most stressed, may be the most relevant data on a seasonal basis.

The portion of the site with the highest concentrations of metals and ABM (Near Shore Area and portions of the Marina) typically has the most developed benthic invertebrate community relative to other areas of the site (Dry Dock and Offshore Areas), where metals concentrations and ABM are typically lower. None of the Dry Dock samples, and very few of the Offshore Area samples, fail both the percent ABM and RQ criteria. The impacts to the benthic invertebrate community in these areas appear to be related to physical factors not associated with SWMU 3 (such as water depth and bottom DO concentrations). Since ABM is essentially inert (based upon grain size analysis, ABM appears predominantly in the coarse sand fraction; the “black beauty” materials consist mainly of silicon dioxide [sand], aluminum oxide, iron oxide, and calcium oxide) and the metals in the paint residues do not decay (since they are elements, although they may change chemical form based upon ambient environmental conditions) and increase sediment oxygen demand, these site-related factors do not contribute to reduced DO levels at the bottom of the water column.

Although the current, non-CERCLA-related physical characteristics of the site (such as bottom DO concentrations) may be having more of an impact on the condition of the benthic invertebrate community than the CERCLA-related metals detected in site sediments (due to bioavailability considerations), the magnitude of these metals concentrations may potentially result in unacceptable risks to ecological receptors should these physical characteristics change over time; therefore, remedial action at SWMU 3 is warranted. Given the current physical limitations in the Dry Dock and Offshore Areas (primarily low bottom DO concentrations), it is unlikely that a benthic invertebrate community that would approach that in a similar urban reference area would be established following remedial action; therefore, the remedial action objectives established for the site should focus on the reduction of metals concentrations and not the establishment of a comparable (to an urban reference condition) benthic invertebrate community.

## 7.0 References

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## Tables

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TABLE 1  
Sediment PRGs  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
*JEB Little Creek, Virginia Beach, Virginia*

Copper		Lead		Nickel		Tin		Zinc	
TEL	18.7	TEL	30.2	TEL	15.9	Mean Background	8.61	TEL	124
ER-L	34	Mean Background	45.2	ER-L	20.9	Max Background	9.8	ER-L	150
PEL	108	ER-L	46.7	Mean Background	23.2	1% ABM	11.2	PEL	271
Mean Background	155	Max Background	67.6	1% ABM	26.2	ER-L	NA	Mean Background	290
Max Background	184	1% ABM	107	Max Background	26.5	ER-M	NA	ER-M	410
1% ABM	232	PEL	112	PEL	42.8	TEL	NA	Max Background	421
ER-M	270	ER-M	218	ER-M	51.6	PEL	NA	1% ABM	454

**Notes:**

Shaded cells indicate the selected PRG

Values are in milligrams per kilogram (mg/kg)

ER-L – effects range low

ER-M – effects range median

PEL – probable effects level

TEL – threshold effects level

TABLE 2  
Sample Summary  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/ SOP187)	TOC (Lloyd Kahn/ SOP 221)	AVS/SEM (EPA 821-R-91-100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD501	<i>LW03-SD501-00-10C</i>	9/2/2010	7:55:00	12159250.5	3500149.0	4.3	1.3	-3.1	X	X	X	X	X	X
	LW03-SD501-01-10C	--	--	12159251.3	3500121.0	4.7	1.3	-3.4						
	LW03-SD501-02-10C	--	--	12159229.6	3500179.4	3.5	1.3	-2.2						
	LW03-SD501-03-10C	--	--	12159279.4	3500179.3	9.2	1.3	-7.9						
LW03-SD502	<i>LW03-SD502-00-10C</i>	9/2/2010	8:30:00	12159250.4	3500250.4	8.9	0.4	-8.5	X	X	X	X	X	X
	LW03-SD502-01-10C	--	--	12159235.0	3500221.6	8.3	0.4	-7.8						
	LW03-SD502-02-10C	--	--	12159277.3	3500221.3	8.9	0.4	-8.5						
	LW03-SD502-03-10C	--	--	12159254.1	3500270.7	9.6	0.4	-9.2						
LW03-SD503	<i>LW03-SD503-00-10C</i>	9/2/2010	9:40	12159262.8	3500357.9	4.4	0.2	-4.3	X	X	X	X	X	X
	LW03-SD503-01-10C	--	--	12159277.9	3500379.7	5.4	0.2	-5.3						
	LW03-SD503-02-10C	--	--	12159250.2	3500330.8	5.4	0.2	-5.3						
	LW03-SD503-03-10C	--	--	12159287.8	3500329.3	4.3	0.2	-4.2						
LW03-SD504	<i>LW03-SD504-00-10C</i>	8/31/2010	10:30	12159350.8	3500050.5	17.3	1.3	-16.1	X	X	X	X	X	X
	LW03-SD504-01-10C	--	--	12159320.0	3500077.4	14.9	0.4	-14.5						
	LW03-SD504-02-10C	--	--	12159378.0	3500078.6	16.9	0.4	-16.5						
	LW03-SD504-03-10C	--	--	12159337.8	3500030.1	12.8	0.4	-12.4						
LW03-SD504A	<i>LW03-SD504A-00-10C</i>	8/31/2010	8:30	12159349.1	3499949.0	12.3	1.5	-10.8	X	X	X	X	X	X
	LW03-SD504A-01-10C	--	--	12159329.2	3499926.6	4.8	-0.5	-5.2						
	LW03-SD504A-02-10C	--	--	12159378.6	3499921.5	13.7	-0.5	-14.2						
	LW03-SD504A-03-10C	--	--	12159350.1	3499977.8	10.9	-0.5	-11.4						
LW03-SD505	<i>LW03-SD505-00-10C</i>	8/31/2010	15:20	12159348.0	3500151.1	14.5	1.1	-13.4	X	X	X	X	X	X
	LW03-SD505-01-10C	--	--	12159323.1	3500120.3	13.8	1.4	-12.3						
	LW03-SD505-02-10C	--	--	12159378.6	3500120.0	15.7	1.4	-14.2						
	LW03-SD505-03-10C	--	--	12159349.9	3500178.9	13.4	1.4	-12.0						
LW03-SD506	<i>LW03-SD506-00-10C</i>	9/10/2010	11:45	12159349.7	3500250.2	13.8	1.4	-12.3	X	X	X	X	X	X
	<i>LW03-SD506P-00-10C</i>	9/10/2010	11:50						X					
	LW03-SD506-01-10C	--	--	12159348.6	3500221.5	14.3	1.4	-12.8						
	LW03-SD506-02-10C	--	--	12159321.1	3500279.9	9.8	1.4	-8.4						
	LW03-SD506-03-10C	--	--	12159377.6	3500279.1	13.8	1.4	-12.4						
LW03-SD507	<i>LW03-SD507-00-10C</i>	9/2/2010	12:55	12159349.6	3500349.9	8.4	-0.4	-8.8	X	X	X	X	X	X
	LW03-SD507-01-10C	--	--	12159351.5	3500379.8	8.0	-0.4	-8.4						
	LW03-SD507-02-10C	--	--	12159380.1	3500320.4	11.3	-0.4	-11.6						
	LW03-SD507-03-10C	--	--	12159322.3	3500322.7	7.1	-0.4	-7.5						
LW03-SD508	<i>LW03-SD508-00-10C</i>	9/10/2010	16:15	12159355.7	3500458.1	5.6	-1.9	-7.5	X	X	X	X	X	X
	LW03-SD508-01-10C	--	--	12159327.3	3500474.7	4.9	-1.9	-6.8						
	LW03-SD508-02-10C	--	--	12159379.0	3500479.8	5.8	-1.9	-7.7						
	LW03-SD508-03-10C	--	--	12159387.5	3500420.6	7.6	-1.9	-9.5						

TABLE 2  
Sample Summary  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/SOP187)	TOC (Lloyd Kahn/SOP 221)	AVS/SEM (EPA 821-R-91-100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD509	<i>LW03-SD509-00-10C</i>	9/9/2010	8:40	12159348.4	3500550.3	5.4	1.7	-3.8	X	X	X	X	X	X
	LW03-SD509-01-10C	--	--	12159321.8	3500521.6	5.6	1.7	-3.9						
	LW03-SD509-02-10C	--	--	12159350.0	3500579.8	5.5	1.7	-3.8						
	LW03-SD509-03-10C	--	--	12159377.6	3500516.3	9.1	1.7	-7.4						
LW03-SD510	<i>LW03-SD510-00-10C</i>	8/31/2010	11:20	12159448.5	3500049.2	18.9	1.4	-17.6	X	X	X	X	X	X
	LW03-SD510-01-10C	--	--	12159421.6	3500022.4	18.2	1.0	-17.2						
	LW03-SD510-02-10C	--	--	12159449.5	3500080.2	17.4	1.0	-16.5						
	LW03-SD510-03-10C	--	--	12159476.4	3500021.6	19.3	1.0	-18.3						
LW03-SD511	<i>LW03-SD511-00-10C</i>	8/31/2010	14:10	12159448.9	3500150.8	16.1	1.1	-15.0	X	X	X	X	X	X
	LW03-SD511-01-10C	--	--	12159448.2	3500120.7	16.3	1.4	-14.9						
	LW03-SD511-02-10C	--	--	12159421.8	3500179.9	15.4	1.4	-14.0						
	LW03-SD511-03-10C	--	--	12159479.1	3500177.9	16.9	1.4	-15.5						
LW03-SD512	<i>LW03-SD512-00-10C</i>	9/2/2010	12:25	12159451.1	3500249.6	14.8	0.5	-14.4	X	X	X	X	X	X
	LW03-SD512-01-10C	--	--	12159421.7	3500221.3	14.1	-0.4	-14.5						
	LW03-SD512-02-10C	--	--	12159479.5	3500221.7	15.2	-0.4	-15.5						
	LW03-SD512-03-10C	--	--	12159449.7	3500278.0	13.6	-0.4	-14.0						
LW03-SD513	<i>LW03-SD513-00-10C</i>	9/10/2010	12:40	12159456.3	3500349.1	14.6	0.7	-13.9	X	X	X	X	X	X
	LW03-SD513-01-10C	--	--	12159450.1	3500320.8	14.8	0.7	-14.1						
	LW03-SD513-02-10C	--	--	12159420.3	3500389.8	12.8	0.7	-12.1						
	LW03-SD513-03-10C	--	--	12159481.1	3500378.3	14.1	0.7	-13.4						
LW03-SD514	<i>LW03-SD514-00-10C</i>	9/10/2010	15:30	12159451.0	3500450.8	11.5	-1.2	-12.7	X	X	X	X	X	X
	<i>LW03-SD514P-00-10C</i>	9/10/2010	15:35					-12.7	X					
	LW03-SD514-01-10C	--	--	12159451.1	3500478.5	10.8	-1.2	-11.9						
	LW03-SD514-02-10C	--	--	12159420.8	3500421.8	10.3	-1.2	-11.4						
	LW03-SD514-03-10C	--	--	12159478.7	3500420.8	12.1	-1.2	-13.2						
LW03-SD515	<i>LW03-SD515-00-10C</i>	9/9/2010	14:05	12159454.9	3500564.1	9.8	-0.9	-10.7	X	X	X	X	X	X
	LW03-SD515-01-10C	--	--	12159423.5	3500578.8	9.0	-0.9	-9.9						
	LW03-SD515-02-10C	--	--	12159477.8	3500579.5	9.6	-0.9	-10.5						
	LW03-SD515-03-10C	--	--	12159427.3	3500510.8	7.7	-0.9	-8.6						
LW03-SD516	<i>LW03-SD516-00-10C</i>	9/9/2010	7:55	12159450.6	3500649.5	4.3	1.3	-3.0	X	X	X	X	X	X
	LW03-SD516-01-10C	--	--	12159451.1	3500678.3	3.2	1.3	-1.9						
	LW03-SD516-02-10C	--	--	12159421.7	3500620.6	6.2	1.3	-4.9						
	LW03-SD516-03-10C	--	--	12159478.0	3500621.5	7.8	1.3	-6.6						
LW03-SD517	<i>LW03-SD517-00-10C</i>	8/31/2010	12:35	12159551.8	3500050.5	19.8	1.4	-18.5	X	X	X	X	X	X
	LW03-SD517-01-10C	--	--	12159548.3	3500021.6	18.4	1.5	-16.9						
	LW03-SD517-02-10C	--	--	12159577.8	3500080.5	20.2	1.5	-18.6						
	LW03-SD517-03-10C	--	--	12159521.0	3500077.8	19.8	1.5	-18.2						

TABLE 2  
Sample Summary  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/ SOP187)	TOC (Lloyd Kahn/ SOP 221)	AVS/SEM (EPA 821-R-91-1100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD518	<i>LW03-SD518-00-10C</i>	8/31/2010	13:50	12159549.8	3500150.0	20.2	1.0	-19.1	X	X	X	X	X	X
	<i>LW03-SD518-00-10C-MS</i>	8/31/2010	13:50	12159549.8	3500150.0	20.2	1.0	-19.1	X					
	<i>LW03-SD518-00-10C-SD</i>	8/31/2010	13:50	12159549.8	3500150.0	20.2	1.0	-19.1	X					
	LW03-SD518-01-10C	--	--	12159578.9	3500120.6	20.7	1.4	-19.3						
	LW03-SD518-02-10C	--	--	12159521.6	3500121.4	19.9	1.4	-18.5						
	LW03-SD518-03-10C	--	--	12159548.6	3500178.8	19.9	1.4	-18.5						
LW03-SD519	<i>LW03-SD519-00-10C</i>	9/2/2010	11:40	12159550.6	3500250.5	18.2	0.6	-17.6	X	X	X	X	X	X
	LW03-SD519-01-10C	--	--	12159550.4	3500221.8	18.7	0.6	-18.1						
	LW03-SD519-02-10C	--	--	12159522.5	3500279.4	16.3	0.6	-15.7						
	LW03-SD519-03-10C	--	--	12159578.4	3500265.0	18.8	0.6	-18.2						
LW03-SD520	<i>LW03-SD520-00-10C</i>	9/10/2010	13:45	12159546.7	3500349.8	15.8	-0.8	-16.6	X	X	X	X	X	X
	LW03-SD520-01-10C	--	--	12159526.1	3500320.8	10.5	-0.8	-11.3						
	LW03-SD520-02-10C	--	--	12159575.0	3500324.0	16.7	-0.8	-17.5						
	LW03-SD520-03-10C	--	--	12159550.0	3500380.6	14.8	-0.8	-15.7						
LW03-SD521	<i>LW03-SD521-00-10C</i>	9/12/2010	10:05	12159540.2	3500441.4	15.7	0.7	-14.9	X	X	X	X	X	X
	LW03-SD521-01-10C	--	--	12159551.3	3500421.9	16.3	0.7	-15.6						
	LW03-SD521-02-10C	--	--	12159578.1	3500479.6	15.8	0.7	-15.1						
	LW03-SD521-03-10C	--	--	12159524.8	3500485.4	14.7	0.7	-13.9						
LW03-SD522	<i>LW03-SD522-00-10C</i>	9/9/2010	15:00	12159550.8	3500549.8	9.5	-1.6	-11.1	X	X	X	X	X	X
	LW03-SD522-01-10C	--	--	12159550.9	3500579.5	9.3	-1.6	-11.0						
	LW03-SD522-02-10C	--	--	12159580.3	3500520.7	11.7	-1.6	-13.3						
	LW03-SD522-03-10C	--	--	12159541.1	3500506.5	10.9	-1.6	-12.5						
LW03-SD523	<i>LW03-SD523-00-10C</i>	9/9/2010	9:50	12159550.2	3500650.3	6.1	1.9	-4.2	X	X	X	X	X	X
	LW03-SD523-01-10C	--	--	12159533.2	3500669.1	3.8	1.9	-1.9						
	LW03-SD523-02-10C	--	--	12159580.4	3500673.3	5.1	1.9	-3.2						
	LW03-SD523-03-10C	--	--	12159550.2	3500621.3	10.1	1.9	-8.2						
LW03-SD525	<i>LW03-SD525-00-10C</i>	9/2/2010	10:55	12159632.8	3500240.6	19.9	0.7	-19.2	X	X	X	X	X	X
	LW03-SD525-01-10C	--	--	12159619.0	3500245.4	19.8	0.7	-19.2						
	LW03-SD525-02-10C	--	--	12159679.2	3500215.9	21.3	0.7	-20.6						
	LW03-SD525-03-10C	--	--	12159640.0	3500206.8	21.1	0.7	-20.4						
LW03-SD526	<i>LW03-SD526-00-10C</i>	9/10/2010	14:50	12159651.4	3500350.7	17.8	-1.1	-18.9	X	X	X	X	X	X
	<i>LW03-SD526P-00-10C</i>	9/10/2010	14:55						X					
	LW03-SD526-01-10C	--	--	12159659.6	3500329.7	18.0	-1.1	-19.1						
	LW03-SD526-02-10C	--	--	12159620.5	3500379.4	16.7	-1.1	-17.8						
	LW03-SD526-03-10C	--	--	12159677.9	3500379.4	17.8	-1.1	-18.9						
LW03-SD527	<i>LW03-SD527-00-10C</i>	9/12/2010	9:15	12159649.5	3500458.6	13.2	0.1	-13.1	X	X	X	X	X	X
	LW03-SD527-01-10C	--	--	12159652.4	3500479.4	17.1	0.1	-17.0						
	LW03-SD527-02-10C	--	--	12159679.0	3500420.2	18.9	0.1	-18.8						
	LW03-SD527-03-10C	--	--	12159613.9	3500412.2	18.4	0.1	-18.3						



TABLE 2  
Sample Summary  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/SOP187)	TOC (Lloyd Kahn/SOP 221)	AVS/SEM (EPA 821-R-91-1100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD528	<i>LW03-SD528-00-10C</i>	9/9/2010	15:40	12159650.2	3500550.7	13.5	-1.9	-15.4	X	X	X	X	X	X
	LW03-SD528-01-10C	--	--	12159678.0	3500579.7	15.6	-1.9	-17.5						
	LW03-SD528-02-10C	--	--	12159622.1	3500579.2	11.3	-1.9	-13.2						
	LW03-SD528-03-10C	--	--	12159649.6	3500521.0	14.0	-1.9	-15.9						
LW03-SD529	<i>LW03-SD529-00-10C</i>	9/9/2010	10:40	12159649.3	3500650.4	9.2	1.5	-7.6	X	X	X	X	X	X
	<i>LW03-SD529-00-10C-MS</i>	9/9/2010	10:40						X					
	<i>LW03-SD529-00-10C-SD</i>	9/9/2010	10:40						X					
	LW03-SD529-01-10C	--	--	12159648.9	3500677.1	7.5	1.5	-6.0						
	LW03-SD529-02-10C	--	--	12159620.7	3500621.1	10.5	1.5	-9.0						
	LW03-SD529-03-10C	--	--	12159677.8	3500620.4	15.3	1.5	-13.7						
LW03-SD530	<i>LW03-SD530-00-10C</i>	9/2/2010	10:30	12159773.7	3500245.2	22.8	0.9	-22.0	X	X	X	X	X	X
	LW03-SD530-01-10C	--	--	12159761.8	3500219.0	23.0	0.9	-22.1						
	LW03-SD530-02-10C	--	--	12159782.1	3500280.4	22.4	0.9	-21.5						
	LW03-SD530-03-10C	--	--	12159737.0	3500297.8	21.8	0.9	-21.0						
LW03-SD533	<i>LW03-SD533-00-10C</i>	9/1/2010	8:40	12159751.3	3500549.6	21.5	-0.5	-22.0	X	X	X	X	X	X
	LW03-SD533-01-10C	--	--	12159749.3	3500581.1	26.4	-0.4	-26.8						
	LW03-SD533-02-10C	--	--	12159721.6	3500521.7	15.9	-0.4	-16.3						
	LW03-SD533-03-10C	--	--	12159778.8	3500521.3	18.2	-0.4	-18.5						
LW03-SD534	<i>LW03-SD534-00-10C</i>	9/1/2010	7:45	12159781.5	3500661.1	30.8	-0.1	-30.9	X	X	X	X	X	
	<i>LW03-SD534-01-10C</i>	9/1/2010	7:45	12159779.1	3500679.5	25.8	-0.7	-26.6						X
	<i>LW03-SD534-02-10C</i>	9/1/2010	7:45	12159755.1	3500608.2	29.0	-0.7	-29.7						X
	<i>LW03-SD534-03-10C</i>	9/1/2010	7:45	12159701.5	3500641.4	12.7	-0.7	-13.4						X
LW03-SD535	<i>LW03-SD535-00-10C</i>	9/1/2010	15:05	12159749.0	3500749.5	13.8	-1.3	-15.0	X	X	X	X	X	X
	LW03-SD535-01-10C	--	--	12159779.7	3500722.0	19.5	1.5	-18.0						
	LW03-SD535-02-10C	--	--	12159722.1	3500721.7	15.3	1.5	-13.8						
	LW03-SD535-03-10C	--	--	12159751.3	3500778.6	14.7	1.5	-13.1						
LW03-SD537	<i>LW03-SD537-00-10C</i>	9/1/2010	9:50	12159849.1	3500450.7	18.4	-0.6	-19.1	X	X	X	X	X	X
	<i>LW03-SD537-00-10C-MS</i>	9/1/2010	9:50						X					
	<i>LW03-SD537-00-10C-SD</i>	9/1/2010	9:50						X					
	LW03-SD537-01-10C	--	--	12159850.5	3500480.3	19.5	0.1	-19.4						
	LW03-SD537-02-10C	--	--	12159877.6	3500420.6	18.7	0.1	-18.6						
	LW03-SD537-03-10C	--	--	12159822.0	3500420.9	18.8	0.1	-18.8						
LW03-SD538	<i>LW03-SD538-00-10C</i>	9/1/2010	9:15	12159848.7	3500548.4	29.8	-0.4	-30.3	X	X	X	X	X	X
	LW03-SD538-01-10C	--	--	12159820.0	3500562.8	29.3	0.0	-29.3						
	LW03-SD538-02-10C	--	--	12159886.9	3500528.0	28.0	0.0	-28.0						
	LW03-SD538-03-10C	--	--	12159837.4	3500525.3	24.1	0.0	-24.1						
LW03-SD539	<i>LW03-SD539-00-10C</i>	9/1/2010	10:35	12159850.0	3500650.1	29.7	-1.2	-30.8	X	X	X	X	X	X
	LW03-SD539-01-10C	--	--	12159835.9	3500639.1	32.7	0.4	-32.3						
	LW03-SD539-02-10C	--	--	12159851.4	3500679.2	21.1	0.4	-20.7						
	LW03-SD539-03-10C	--	--	12159878.3	3500619.8	32.2	0.4	-31.8						

TABLE 2  
Sample Summary  
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SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/ SOP187)	TOC (Lloyd Kahn/ SOP 221)	AVS/SEM (EPA 821-R-91-100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD540	<i>LW03-SD540-00-10C</i>	9/1/2010	15:50	12159849.0	3500749.7	17.2	-1.2	-18.3	X	X	X	X	X	X
	<i>LW03-SD540P-00-10C</i>	9/1/2010	15:55						X					
	LW03-SD540-01-10C	--	--	12159852.3	3500720.1	19.6	1.4	-18.2						
	LW03-SD540-02-10C	--	--	12159879.8	3500780.5	19.5	1.4	-18.1						
	LW03-SD540-03-10C	--	--	12159821.6	3500778.0	18.1	1.4	-16.7						
LW03-SD541	<i>LW03-SD541-00-10C</i>	9/7/2010	12:55	12159850.4	3500846.1	12.3	-1.5	-13.8	X	X	X	X	X	X
	LW03-SD541-01-10C	--	--	12159867.4	3500873.7	11.1	-1.5	-12.6						
	LW03-SD541-02-10C	--	--	12159822.0	3500821.2	13.0	-1.5	-14.5						
	LW03-SD541-03-10C	--	--	12159878.5	3500820.8	16.3	-1.5	-17.8						
LW03-SD543	<i>LW03-SD543-00-10C</i>	9/1/2010	14:30	12159951.8	3500449.6	19.8	-0.7	-20.5	X	X	X	X	X	X
	LW03-SD543-01-10C	--	--	12159950.4	3500420.9	21.0	1.7	-19.3						
	LW03-SD543-02-10C	--	--	12159921.9	3500478.5	25.2	1.7	-23.5						
	LW03-SD543-03-10C	--	--	12159979.4	3500478.2	28.1	1.7	-26.4						
LW03-SD544	<i>LW03-SD544-00-10C</i>	9/1/2010	13:55	12159954.4	3500548.3	34.3	-0.8	-35.1	X	X	X	X	X	X
	LW03-SD544-01-10C	--	--	12159950.8	3500578.6	34.6	1.7	-32.8						
	LW03-SD544-02-10C	--	--	12159979.4	3500520.8	33.8	1.7	-32.0						
	LW03-SD544-03-10C	--	--	12159921.0	3500520.0	33.8	1.7	-32.0						
LW03-SD545	<i>LW03-SD545-00-10C</i>	9/1/2010	13:15	12159950.4	3500650.7	19.3	-1.1	-20.3	X	X	X	X	X	X
	LW03-SD545-01-10C	--	--	12159949.2	3500621.3	26.9	1.6	-25.3						
	LW03-SD545-02-10C	--	--	12159921.1	3500679.3	20.8	1.6	-19.2						
	LW03-SD545-03-10C	--	--	12159979.6	3500679.1	20.9	1.6	-19.3						
LW03-SD546	<i>LW03-SD546-00-10C</i>	9/1/2010	16:25	12159950.3	3500749.3	18.8	-1.3	-20.1	X	X	X	X	X	X
	LW03-SD546-01-10C	--	--	12159922.1	3500720.3	20.9	1.2	-19.7						
	LW03-SD546-02-10C	--	--	12159978.9	3500722.2	21.1	1.2	-19.9						
	LW03-SD546-03-10C	--	--	12159950.9	3500780.4	20.6	1.2	-19.4						
LW03-SD547	<i>LW03-SD547-00-10C</i>	9/7/2010	13:40	12159951.0	3500849.9	17.8	-1.9	-19.6	X	X	X	X	X	X
	<i>LW03-SD547P-00-10C</i>	9/7/2010	13:45						X					
	LW03-SD547-01-10C	--	--	12159922.2	3500879.2	14.4	-1.9	-16.3						
	LW03-SD547-02-10C	--	--	12159978.8	3500879.3	14.6	-1.9	-16.4						
	LW03-SD547-03-10C	--	--	12159950.8	3500819.7	18.2	-1.9	-20.0						
LW03-SD548	<i>LW03-SD548-00-10C</i>	9/9/2010	12:10	12160050.9	3500349.7	23.1	0.7	-22.4	X	X	X	X	X	X
	LW03-SD548-01-10C	--	--	12160049.6	3500320.9	22.8	0.7	-22.2						
	LW03-SD548-02-10C	--	--	12160021.9	3500378.4	21.8	0.7	-21.1						
	LW03-SD548-03-10C	--	--	12160079.3	3500379.3	21.9	0.7	-21.2						
LW03-SD549	<i>LW03-SD549-00-10C</i>	9/9/2010	12:55	12160050.2	3500449.8	21.1	0.0	-21.1	X	X	X	X	X	X
	LW03-SD549-01-10C	--	--	12160021.8	3500420.9	21.3	0.0	-21.2						
	LW03-SD549-02-10C	--	--	12160079.6	3500420.1	20.8	0.0	-20.8						
	LW03-SD549-03-10C	--	--	12160050.6	3500479.1	20.6	0.0	-20.6						

TABLE 2  
Sample Summary  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/ SOP187)	TOC (Lloyd Kahn/ SOP 221)	AVS/SEM (EPA 821-R-91-1100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD550	LW03-SD550-00-10C	9/8/2010	12:40	12160048.7	3500550.1	23.3	-1.3	-24.6	X	X	X	X	X	
	LW03-SD550-01-10C	9/8/2010	12:40	12160021.1	3500578.5	27.8	-1.3	-29.1						X
	LW03-SD550-02-10C	9/8/2010	12:40	12160079.7	3500578.4	19.1	-1.3	-20.4						X
	LW03-SD550-03-10C	9/8/2010	12:40	12160051.1	3500520.5	19.9	-1.3	-21.2						X
LW03-SD551	LW03-SD551-00-10C	9/8/2010	10:30	12160048.2	3500649.7	20.6	0.4	-20.1	X	X	X	X	X	X
	LW03-SD551-01-10C	--	--	12160050.2	3500678.2	22.8	0.4	-22.4						
	LW03-SD551-02-10C	--	--	12160078.0	3500621.6	21.0	0.4	-20.6						
	LW03-SD551-03-10C	--	--	12160021.9	3500620.2	20.8	0.4	-20.3						
LW03-SD552	LW03-SD552-00-10C	9/7/2010	16:25	12160050.3	3500749.6	20.3	-0.9	-21.1	X	X	X	X	X	X
	LW03-SD552-01-10C	--	--	12160020.7	3500779.3	20.1	-0.9	-21.0						
	LW03-SD552-02-10C	--	--	12160079.6	3500779.1	20.8	-0.9	-21.6						
	LW03-SD552-03-10C	--	--	12160049.3	3500721.3	20.8	-0.9	-21.7						
LW03-SD553	LW03-SD553-00-10C	9/7/2010	14:30	12160050.4	3500850.6	13.7	-1.9	-15.6	X	X	X	X	X	X
	LW03-SD553-01-10C	--	--	12160048.1	3500863.6	13.2	-1.9	-15.1						
	LW03-SD553-02-10C	--	--	12160022.9	3500821.8	18.3	-1.9	-20.2						
	LW03-SD553-03-10C	--	--	12160078.6	3500821.6	16.4	-1.9	-18.3						
LW03-SD555	LW03-SD555-00-10C	9/9/2010	13:30	12160150.3	3500449.4	20.6	-0.5	-21.1	X	X	X	X	X	X
	LW03-SD555-01-10C	--	--	12160150.7	3500420.0	21.8	-0.5	-22.3						
	LW03-SD555-02-10C	--	--	12160178.6	3500479.1	20.6	-0.5	-21.1						
	LW03-SD555-03-10C	--	--	12160122.5	3500478.1	19.8	-0.5	-20.3						
LW03-SD556	LW03-SD556-00-10C	9/8/2010	13:40	12160151.9	3500549.8	19.5	-2.0	-21.5	X	X	X	X	X	X
	LW03-SD556P-00-10C	9/8/2010	13:45						X					
	LW03-SD556-01-10C	--	--	12160149.6	3500578.0	19.4	-2.0	-21.4						
	LW03-SD556-02-10C	--	--	12160121.7	3500521.8	17.7	-2.0	-19.7						
	LW03-SD556-03-10C	--	--	12160179.5	3500521.0	19.6	-2.0	-21.6						
LW03-SD557	LW03-SD557-00-10C	9/8/2010	11:15	12160150.2	3500651.0	21.6	0.0	-21.6	X	X	X	X	X	X
	LW03-SD557-01-10C	--	--	12160179.0	3500678.6	22.4	0.0	-22.4						
	LW03-SD557-02-10C	--	--	12160123.6	3500678.5	22.2	0.0	-22.2						
	LW03-SD557-03-10C	--	--	12160148.3	3500620.6	21.0	0.0	-21.0						
LW03-SD558	LW03-SD558-00-10C	9/8/2010	8:25	12160148.9	3500749.8	24.3	0.6	-23.6	X	X	X	X	X	
	LW03-SD558-01-10C	9/8/2010	8:25	12160150.1	3500779.2	23.6	0.6	-22.9						X
	LW03-SD558-02-10C	9/8/2010	8:25	12160178.4	3500721.5	24.5	0.6	-23.9						X
	LW03-SD558-03-10C	9/8/2010	8:25	12160121.1	3500720.8	23.6	0.6	-22.9						X
LW03-SD559	LW03-SD559-00-10C	9/7/2010	15:30	12160149.3	3500849.7	11.2	-1.4	-12.6	X	X	X	X	X	X
	LW03-SD559-01-10C	--	--	12160141.6	3500876.3	13.3	-1.4	-14.7						
	LW03-SD559-02-10C	--	--	12160178.5	3500878.3	20.3	-1.4	-21.8						
	LW03-SD559-03-10C	--	--	12160149.4	3500821.6	20.1	-1.4	-21.5						

TABLE 2  
Sample Summary  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	Sample ID <sup>1,2</sup>	Sample Collection Date	Sample Collection Time	Easting (X)	Northing (Y)	Water Depth (feet)	Water Elevation (feet NAVD88)	Sediment Surface Elevation (feet NAVD88)	Analyses					
									SWMU 3 COCs <sup>3</sup> (SW-846 6010B/SOP105 and SW-846 7471A/SOP104)	pH (SW-846 9045C/ SOP187)	TOC (Lloyd Kahn/ SOP 221)	AVS/SEM (EPA 821-R-91-1100/AVS/SEM)	Grainsize (ASTM D422)	Benthic Invertebrates (SOP IZ-06)
LW03-SD562	<b><i>LW03-SD562-00-10C</i></b>	9/8/2010	14:30	12160251.4	3500551.1	20.1	-2.3	-22.4	X	X	X	X	X	X
	LW03-SD562-01-10C	--	--	12160279.0	3500579.4	20.2	-2.3	-22.5						
	LW03-SD562-02-10C	--	--	12160219.7	3500579.5	19.7	-2.3	-22.0						
	LW03-SD562-03-10C	--	--	12160250.6	3500521.8	20.3	-2.3	-22.6						
LW03-SD563	<b><i>LW03-SD563-00-10C</i></b>	9/8/2010	11:55	12160248.8	3500650.3	21.2	-1.4	-22.6	X	X	X	X	X	X
	LW03-SD563-01-10C	--	--	12160249.2	3500680.4	21.5	-1.4	-22.9						
	LW03-SD563-02-10C	--	--	12160278.5	3500620.3	21.6	-1.4	-23.0						
	LW03-SD563-03-10C	--	--	12160221.8	3500620.4	21.4	-1.4	-22.9						
LW03-SD564	<b><i>LW03-SD564-00-10C</i></b>	9/8/2010	9:15	12160250.8	3500749.8	23.6	0.8	-22.8	X	X	X	X	X	X
	LW03-SD564-01-10C	--	--	12160220.9	3500779.3	23.8	0.8	-23.1						
	LW03-SD564-02-10C	--	--	12160277.6	3500780.3	23.2	0.8	-22.4						
	LW03-SD564-03-10C	--	--	12160249.4	3500721.8	23.6	0.8	-22.8						
LW03-SD567	<b><i>LW03-SD567-00-10C</i></b>	9/8/2010	15:10	12160349.8	3500550.4	20.3	-2.4	-22.7	X	X	X	X	X	X
	LW03-SD567-01-10C	--	--	12160349.9	3500579.9	20.5	-2.4	-22.9						
	LW03-SD567-02-10C	--	--	12160321.1	3500521.8	21.4	-2.4	-23.8						
	LW03-SD567-03-10C	--	--	12160378.0	3500521.5	20.7	-2.4	-23.0						
LW03-SD571	<b><i>LW03-SD571-00-10C</i></b>	9/8/2010	15:55	12160449.5	3500550.8	20.3	-2.2	-22.5	X	X	X	X	X	X
	LW03-SD571-01-10C	--	--	12160422.2	3500579.5	20.4	-2.2	-22.6						
	LW03-SD571-02-10C	--	--	12160478.6	3500579.0	20.4	-2.2	-22.6						
	LW03-SD571-03-10C	--	--	12160449.3	3500520.5	21.2	-2.2	-23.4						
LW03-SD574	<b><i>LW03-SD574-00-10C</i></b>	8/31/2010	9:38	12159448.6	3499950.1	19.9	1.4	-18.5	X	X	X	X	X	X
	LW03-SD574-01-10C	--	--	12159422.3	3499978.3	17.2	-0.6	-17.8						
	LW03-SD574-02-10C	--	--	12159448.9	3499922.2	18.1	-0.6	-18.7						
	LW03-SD574-03-10C	--	--	12159478.1	3499979.3	18.5	-0.6	-19.1						

Notes:

1. ***Bold, italic*** font indicates sample IDs for physical and/or chemical analyses. Sample IDs shown in plain font identify locations where grabs were collected for composition.

2. Water quality parameters were collected from the mid-point of each grid. The sample ID used for the composite samples is associated with the center of the each sampling grid.

3. SWMU 3 COCs are copper, lead, nickel, tin, and zinc.

TABLE 3  
Surface Water Quality Field Parameters  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	LW03-SD501			LW03-SD502			LW03-SD503			LW03-SD504A			LW03-SD504			LW03-SD505		
Sample Depth (feet below water surface)	0.88	2.3	4.3	0.8	4.7	7.7	0.6	1.6	3.7	0.9	6.3	11.5	0.9	9.4	16.3	0.5	6.5	13.4
Sample Date	9/2/2010			9/2/2010			9/2/2010			8/31/2010			8/31/2010			8/31/2010		
Field Parameters																		
ABM (% in composite sediment sample)	0.1	--	--	0.2	--	--	0.1	--	--	0.5	--	--	0.25	--	--	1	--	--
Average Redox (depth in mm below sediment surface)*	1	--	--	1	--	--	1.2	--	--	NV	--	--	1.1	--	--	4.75	--	--
Dissolved Oxygen (mg/L)	6.52	5.9	5.78	7.04	5.43	4.48	7.11	5.75	4.54	6.3	5.84	4.35	6.65	5.66	0.78	6.89	5.97	5.09
Oxidation Reduction Potential (mV)	-27.9	-15.2	-9.5	66.7	69.5	69.4	79.8	81.3	80.4	155.2	158.6	163.4	75.7	78.1	-102.9	23.8	35.3	37
pH (ph)	7.88	7.84	7.85	7.91	7.83	7.75	7.92	7.82	7.76	7.85	7.84	7.77	7.89	7.81	7.73	7.89	7.86	7.81
Salinity (ppt)	20.65	24.92	25.1	24.61	25.3	25.42	22.85	24.86	25.13	24.73	25.2	25.63	24.33	25.49	25.7	22.48	25.25	25.71
Specific Conductivity (ms/cm)	37.15	38.29	39.48	38.25	39.74	40.02	36.06	39.11	39.5	39.01	39.61	40.18	38.66	40.02	40.28	36.67	39.61	40.31
Temperature (°C)	26.21	26.6	26.55	26.51	26.38	26.23	26.56	26.75	26.64	26.56	26.4	26.13	26.1	26.19	26.08	25.84	26.41	26.09
Turbidity (NTU)	2.3	2.4	4.6	3.2	3.5	7.3	2.9	3.8	5.7	1.8	3.1	9.7	2.7	3.3	8.8	2.8	2.3	4.6

Station ID	LW03-SD506			LW03-SD507			LW03-SD508			LW03-SD509			LW03-SD510			LW03-SD511		
Sample Depth (feet)	1	6.7	12.6	0.6	4.8	7.8	0.9	3.1	5	0.5	2.5	4.6	1.1	8.7	18.1	0.7	8.4	19.8
Sample Date	9/10/2010			9/2/2010			9/10/2010			9/9/2010			8/31/2010			8/31/2010		
Field Parameters																		
ABM (% in composite sediment sample)	2	--	--	0.05	--	--	0.5	--	--	20	--	--	0.5	--	--	0.8	--	--
Average Redox (depth in mm below sediment surface)*	8.1	--	--	0.87	--	--	2.6	--	--	0.5	--	--	7.3	--	--	5.9	--	--
Dissolved Oxygen (mg/L)	6.15	5.59	5.34	6.78	5.51	4.51	7.58	6.68	6.56	4.63	4.66	4.55	6.73	5.77	4.19	6.67	5.43	5.03
Oxidation Reduction Potential (mV)	150.9	151.1	150.8	83.4	84.4	84.3	141.5	142.6	103.1	138.8	137.4	136.3	66.8	71	72.7	44.6	46.4	47.6
pH (ph)	7.83	7.81	7.81	7.89	7.82	7.75	7.93	7.89	7.89	7.73	7.78	7.79	7.9	7.85	7.74	7.89	7.82	7.81
Salinity (ppt)	22.64	24.29	24.27	24.46	25.22	25.43	21.58	23.32	23.74	21.44	22.25	22.29	24.72	25.41	25.8	25	25.48	25.73
Specific Conductivity (ms/cm)	35.69	38.3	38.25	38.46	39.61	39.9	34.27	37.02	37.5	39.17	35.33	35.42	38.96	39.82	40.42	39.4	40.02	40.31
Temperature (°C)	25.12	25.75	25.56	26.65	26.38	26.3	25.69	25.97	26.02	25.37	25.85	25.86	26.52	26.32	26.06	26.51	26.22	26.09
Turbidity (NTU)	1.9	4.9	6.5	3.3	4.1	6	2.9	3	NA	3.1	2.5	5.6	2.2	2.1	7.5	2.2	2.5	4.6

Station ID	LW03-SD512			LW03-SD513			LW03-SD514			LW03-SD515			LW03-SD516			LW03-SD517		
Sample Depth (feet)	1.1	7.9	13.3	1.1	8.1	13.8	0.9	5.6	9.7	0.8	4.4	8.7	0.9	2.5	3.3	1.2	10.5	18.6
Sample Date	9/2/2010			9/10/2010			9/10/2010			9/9/2010			9/9/2010			8/31/2010		
Field Parameters																		
ABM (% in composite sediment sample)	0.3	--	--	1.5	--	--	1.2	--	--	5	--	--	50	--	--	0.25	--	--
Average Redox (depth in mm below sediment surface)*	0.8	--	--	0.5	--	--	0.5	--	--	7.3	--	--	NV	--	--	2	--	--
Dissolved Oxygen (mg/L)	7.46	5.82	5.25	6.34	5.8	4.9	7.24	6.82	5.02	6.15	5.34	5.15	5.56	5.07	4.51	6.53	6.02	3.07
Oxidation Reduction Potential (mV)	61.3	63.4	64.1	152.9	153.5	151.5	124.1	124.8	124.4	114.8	116.4	116.2	146.4	146.8	145.9	62.8	71.1	51.4
pH (ph)	7.94	7.86	7.82	7.85	7.82	7.78	7.87	7.89	7.75	7.88	7.84	7.84	7.77	7.76	7.76	7.87	7.85	7.67
Salinity (ppt)	24	25.53	25.63	22.84	24.27	24.3	22.05	24.04	24.28	19.87	22.15	22.22	19.58	21.42	21.89	24.34	25.61	25.9
Specific Conductivity (ms/cm)	37.73	40.08	40.18	36.24	38.24	38.28	34.75	37.93	38.24	31.52	35.23	35.33	31.81	34.21	34.67	38.33	40.15	40.56
Temperature (°C)	26.56	26.17	26.11	25.26	25.56	25.47	25.81	26.15	25.54	26.24	26.01	25.84	23.87	25.01	25.53	26.54	26.17	26.01
Turbidity (NTU)	2	2	3	1.8	4	15.8	2.8	1.8	7.9	3.6	4.7	6.3	2.2	2.2	3	2.4	2.4	11.1

TABLE 3  
Surface Water Quality Field Parameters  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	LW03-SD518			LW03-SD519			LW03-SD520			LW03-SD521			LW03-SD522			LW03-SD523		
Sample Depth (feet)	0.7	10.9	19.2	6	9.9	17.3	0.5	7.8	14.7	0.9	6.3	14.8	0.5	4.3	8.8	0.9	3.6	6
Sample Date	8/31/2010			9/2/2010			9/10/2010			9/12/2010			9/9/2010			9/9/2010		
Field Parameters																		
ABM (% in composite sediment sample)	0.2	--	--	0.4	--	--	1.5	--	--	50	--	--	9	--	--	35	--	--
Average Redox (depth in mm below sediment surface)*	3.8	--	--	0.75	--	--	0.5	--	--	NV	--	--	5.3	--	--	0.5	--	--
Dissolved Oxygen (mg/L)	6.95	5.67	4.41	7.19	5.77	4.96	4.94	5.79	4.86	4.63	5.84	5.32	6.23	5.8	5.13	5.09	5.14	5.13
Oxidation Reduction Potential (mV)	53	57	-27.4	52.4	55.1	55.7	180	170.4	164.8	159.6	159.5	156.1	117.1	118.7	118.9	125.6	124.8	124.9
pH (ph)	7.9	7.85	7.76	7.94	7.85	7.8	7.83	7.83	7.75	7.71	7.83	7.76	7.9	7.87	7.84	7.82	7.84	7.85
Salinity (ppt)	24.3	25.65	25.76	24.31	25.55	25.66	21.66	24.29	24.32	22.59	22.96	23.02	21.43	22.08	22.22	22.11	22.23	22.24
Specific Conductivity (ms/cm)	38.26	40.21	40.36	38.76	40.08	40.24	34.47	38.28	38.31	35.89	36.36	36.45	34.11	35.12	35.33	35.22	35.36	35.34
Temperature (°C)	26.56	26.13	26.07	26.58	26.17	26.09	25.09	25.81	25.43	25.14	24.91	25.02	26.31	25.93	25.8	25.83	25.86	25.74
Turbidity (NTU)	2.4	2.3	17.7	2.3	2.2	9.8	2.3	2.9	10	1.6	1.5	3.8	3.5	2.4	8.7	2.4	2.8	4.5

Station ID	LW03-SD525			LW03-SD526			LW03-SD527			LW03-SD528			LW03-SD529			LW03-SD530		
Sample Depth (feet)	1.2	9.2	19	0.7	9.2	16.6	0.8	5.7	12.9	0.6	6.7	12.3	0.9	4.3	8.5	0.7	10.7	20.3
Sample Date	9/2/2010			9/10/2010			9/12/2010			9/9/2010			9/9/2010			9/2/2010		
Field Parameters																		
ABM (% in composite sediment sample)	0.6	--	--	0.01	--	--	50	--	--	NA	--	--	15	--	--	0.6	--	--
Average Redox (depth in mm below sediment surface)*	NV	--	--	NV	--	--	1.5	--	--	1.5	--	--	1.1	--	--	NV	--	--
Dissolved Oxygen (mg/L)	7.17	5.75	4.72	7.18	5.67	4.07	5.47	6.03	5.62	6.37	5.96	4.93	5.44	5.28	5.14	6.77	5.83	3.78
Oxidation Reduction Potential (mV)	42.2	45.1	42.5	155.4	156.4	69.3	177.6	177.2	176.9	122.7	122.7	120.5	125.2	125.1	125	13.3	18.9	20
pH (ph)	7.96	7.85	7.78	7.9	7.83	7.74	7.76	7.83	7.79	7.89	7.88	7.81	7.85	7.85	7.84	7.89	7.86	7.76
Salinity (ppt)	24.18	25.55	25.72	22.5	24.29	24.31	22.74	22.9	23.01	21.48	22.15	22.24	22.22	22.24	22.24	24.36	25.55	25.83
Specific Conductivity (ms/cm)	38.36	40.07	40.31	35.48	38.28	38.3	36.15	36.34	36.43	34.1	35.22	35.35	35.32	35.34	35.35	38.83	40.07	40.4
Temperature (°C)	26.53	26.18	26.07	25.24	25.78	27.73	25	24.93	25.01	26.31	25.96	25.77	25.83	25.73	25.68	26.56	26.16	26.04
Turbidity (NTU)	2.5	2	10.3	2.3	3.3	11.8	1.4	1.6	1.9	2.3	2.7	11	2.2	3.1	4.7	2.1	2.2	5.9

Station ID	LW03-SD533			LW03-SD534			LW03-SD535			LW03-SD537			LW03-SD538			LW03-SD539		
Sample Depth (feet)	0.9	10.8	18.1	1.2	15.5	29.7	0.7	7.3	12.3	1.1	9.5	17.4	0.6	15.4	26.2	0.5	15.1	29.3
Sample Date	9/1/2010			9/1/2010			9/1/2010			9/1/2010			9/1/2010			9/1/2010		
Field Parameters																		
ABM (% in composite sediment sample)	5	--	--	4	--	--	90	--	--	3	--	--	1	--	--	0.5	--	--
Average Redox (depth in mm below sediment surface)*	2.5	--	--	NV	--	--	NV	--	--	7	--	--	NV	--	--	1.5	--	--
Dissolved Oxygen (mg/L)	6.89	6.2	3.62	6.57	5.4	0.54	5.99	5.9	4.64	7.26	6.14	4.82	7.12	5.59	0.77	7.15	4.54	0.54
Oxidation Reduction Potential (mV)	-40.3	-29.5	-29.8	94.1	94.7	-154.8	-19	-10	-7.3	-50.7	-33.5	-26.8	-7.3	-1.8	-134	18.5	21.5	-174.9
pH (ph)	7.9	7.89	7.7	7.9	7.83	6.83	7.82	7.86	7.78	7.94	7.87	7.8	7.93	7.84	7.25	7.93	7.77	7.16
Salinity (ppt)	24.73	25.36	25.68	25.21	25.59	26.47	39.03	25.18	25.37	24.78	25.42	25.59	24.96	25.5	26.32	24.84	25.42	26.37
Specific Conductivity (ms/cm)	39.13	39.81	40.2	39.62	40.16	41.32	38.7	39.58	39.82	38.5	39.89	40.13	39.23	40.01	41.16	39.08	39.9	41.22
Temperature (°C)	26.81	26.14	26.13	26.47	26.16	25.62	27.32	26.42	26.2	26.87	26.19	26.11	26.64	26.15	25.94	27.05	26.17	25.54
Turbidity (NTU)	2.4	2.5	7.4	2.2	3.2	50	2.8	2.8	4.7	2.1	1.9	7.8	2.4	2.7	8.5	2	4.3	28

TABLE 3  
Surface Water Quality Field Parameters  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	LW03-SD540			LW03-SD541			LW03-SD543			LW03-SD544			LW03-SD545			LW03-SD546		
Sample Depth (feet)	0.6	8.1	16.2	1.1	6.8	10.7	0.5	10.8	19.1	0.8	17.1	31.4	1.1	10.8	18.9	1.6	9.5	18.1
Sample Date	9/1/2010			9/7/2010			9/1/2010			9/1/2010			9/1/2010			9/1/2010		
Field Parameters																		
ABM (% in composite sediment sample)	4	--	--	15	--	--	1.5	--	--	0.5	--	--	2	--	--	3	--	--
Average Redox (depth in mm below sediment surface)*	NV	--	--	NV	--	--	NV	--	--	NV	--	--	NV	--	--	NV	--	--
Dissolved Oxygen (mg/L)	7.5	6.72	4.03	7.55	6.33	5.8	7.52	5.99	3.4	7.39	4.96	0.63	7.29	6.17	2.9	7.48	6.77	3.07
Oxidation Reduction Potential (mV)	-59.8	-48	-43.1	-9.4	-5	-33.4	-4.6	4.3	6.1	15.6	14.5	-189.2	11.5	14.7	7.3	8.9	12	-75
pH (ph)	7.97	7.92	7.73	7.96	7.9	7.85	7.96	7.86	7.68	7.95	7.8	6.97	7.9	7.86	7.63	7.97	7.93	7.72
Salinity (ppt)	25.03	25.21	25.49	24.95	25.15	25.26	23.57	25.42	25.72	24.58	25.66	26.49	24.64	25.28	25.66	25.05	25.18	25.5
Specific Conductivity (ms/cm)	39.28	39.59	40.01	39.24	39.5	39.66	36.76	39.91	40.45	39.03	40.18	41.39	39.04	39.71	40.26	39.39	39.55	40.01
Temperature (°C)	26.72	26.27	26.11	26.79	26.51	26.29	26.93	26.17	26.05	27.07	26.1	25.04	27.21	26.21	26.03	26.46	26.36	26.06
Turbidity (NTU)	2.4	2.1	6.6	1.8	1.6	7	2.4	2.4	5.2	2.5	5.7	14.5	1.8	1.9	8.3	2	2	8.2

Station ID	LW03-SD547			LW03-SD548			LW03-SD549			LW03-SD550			LW03-SD551			LW03-SD552		
Sample Depth (feet)	1.1	8.9	15.9	0.5	12.6	21.6	1.1	10.3	20.5	0.6	10.9	18.6	0.7	9.8	18.5	0.7	10.5	17.5
Sample Date	9/7/2010			9/9/2010			9/9/2010			9/8/2010			9/8/2010			9/7/2010		
Field Parameters																		
ABM (% in composite sediment sample)	22	--	--	0	--	--	0.01	--	--	NA	--	--	0.3	--	--	0.03	--	--
Average Redox (depth in mm below sediment surface)*	NV	--	--	NV	--	--	NV	--	--	NV	--	--	1	--	--	NV	--	--
Dissolved Oxygen (mg/L)	7.58	6.34	4.29	6.28	5.61	5.32	6.13	5.62	5.12	5.33	4.44	4.09	5.64	4.9	5.15	8.27	6.8	4.79
Oxidation Reduction Potential (mV)	62.5	63.1	44.8	130.3	126.1	162.1	120.3	120.4	60.3	105.1	105.2	87.9	112.4	112.9	112.8	98.8	100.3	89.9
pH (ph)	7.95	7.88	7.75	7.84	7.86	7.91	7.86	7.86	7.87	7.82	7.79	7.74	7.85	7.82	7.87	8.01	7.93	7.81
Salinity (ppt)	24.68	25.16	25.41	21.38	22.32	22.32	21.58	22.21	22.36	23.73	23.93	23.92	23.45	23.82	23.87	23.47	25.14	25.33
Specific Conductivity (ms/cm)	38.48	39.54	39.87	32.03	35.42	35.42	34.37	35.3	35.35	37.46	37.77	37.75	36.87	37.61	37.69	37.9	39.49	39.74
Temperature (°C)	27.13	26.34	26.17	25.13	25.63	25.44	25.9	25.7	25.5	26.37	26.18	25.88	NA	NA	NA	27.33	26.37	26.2
Turbidity (NTU)	2	2	92	3.2	5.2	5.2	1.6	2	33	2.7	2.9	6.4	2.9	2.6	10.2	2.7	2.1	3.1

Station ID	LW03-SD553			LW03-SD555			LW03-SD556			LW03-SD557			LW03-SD558			LW03-SD559		
Sample Depth (feet)	1	6.6	13.2	0.9	9.5	NA	0.5	9.7	18.7	0.8	11.1	NA	0.7	12.9	22.4	0.8	6	11.3
Sample Date	9/7/2010			9/9/2010			9/8/2010			9/8/2010			9/8/2010			9/7/2010		
Field Parameters																		
ABM (% in composite sediment sample)	30	--	--	0.001	--	--	0.02	--	--	0.03	--	--	0.4	--	--	18	--	--
Average Redox (depth in mm below sediment surface)*	NV	--	--	NV	--	--	NV	--	--	NV	--	--	NV	--	--	NV	--	--
Dissolved Oxygen (mg/L)	7.54	7.11	5.88	5.56	5.83	5.55	5.55	5.45	1.76	5.1	5.02	4.7	5.61	5.07	3.56	7.02	7.03	6.35
Oxidation Reduction Potential (mV)	80.4	81	81.2	111.2	111.1	85	112.2	112.2	110	119.4	118.5	102.6	135.2	134.8	132.4	95.1	95.5	95.8
pH (ph)	7.94	7.93	7.85	7.87	7.88	7.89	7.84	7.88	7.8	7.9	7.83	7.86	7.83	7.83	7.72	7.94	7.9	7.9
Salinity (ppt)	24.33	25.06	25.22	21.1	22.18	22.36	23.35	23.76	23.9	23.68	23.83	23.89	22.86	23.85	23.99	24.23	24.98	25.09
Specific Conductivity (ms/cm)	38.62	39.39	39.63	33.48	35.27	35.46	36.81	37.59	37.73	37.24	37.64	37.68	36.33	37.66	37.86	38.53	39.25	39.41
Temperature (°C)	26.84	26.48	26.25	25.93	25.83	19.7	26.46	25.95	25.83	26.31	26.09	20.5	25.63	26.2	26.07	26.84	26.37	26.29
Turbidity (NTU)	2.7	3.1	2.8	2.3	1.6	4.9	2.8	2	7.7	9	2.7	10.1	1.6	2	8.6	1.9	1.9	1.7

TABLE 3  
Surface Water Quality Field Parameters  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Station ID	LW03-SD562			LW03-SD563			LW03-SD564			LW03-SD567			LW03-SD571			LW03-SD574		
Sample Depth (feet)	0.5	10.6	18.7	1.3	10.1	20.5	0.6	11.5	22.5	1.1	10.6	18.7	1.2	11.5	18.5	0.94	10.5	17.2
Sample Date	9/8/2010			9/8/2010			9/8/2010			9/8/2010			9/8/2010			8/31/2010		
Field Parameters																		
ABM (% in composite sediment sample)	0.01	--	--	0.02	--	--	0.05	--	--	0.02	--	--	0.05	--	--	0.25	--	--
Average Redox (depth in mm below sediment surface)*	NV	--	--	1	--	--	NV	--	--	0.5	--	--	NV	--	--	1.5	--	--
Dissolved Oxygen (mg/L)	5.45	5.19	4.07	4.99	5.06	2.6	5.48	4.61	2.2	5.6	5.61	4.16	5.65	5.3	2.31	6.55	5.45	3.54
Oxidation Reduction Potential (mV)	111.6	112	37.4	116.6	116.1	45.4	119.5	119.9	15	102.6	103.7	83	110.4	111	66.5	151.2	150.6	41.6
pH (ph)	7.85	7.86	7.79	7.84	7.83	7.84	7.83	7.8	7.78	7.88	7.89	7.8	7.88	7.88	7.79	7.87	7.84	7.68
Salinity (ppt)	23.74	23.85	23.88	23.67	23.85	23.87	23.45	23.81	23.95	23.66	23.73	23.87	23.59	23.8	23.88	24.71	25.61	25.91
Specific Conductivity (ms/cm)	37.48	37.62	37.71	37.37	37.65	37.67	36.92	37.6	37.82	37.31	37.58	37.67	37.4	37.61	37.7	38.4	40.15	40.55
Temperature (°C)	26.23	25.92	25.81	26.13	26.03	25.83	26.09	26.09	26.03	26.35	25.84	25.83	26.26	25.84	25.72	26.61	26.14	26.02
Turbidity (NTU)	3.1	2.6	9.7	2.3	2.3	9.4	2.19	3.7	6.6	3.3	2.3	5	2.2	2.7	NA	2	3	4.9

Notes:  
\* Average redox boundary calculated from depth of redox boundary observed in associated grab sample  
°C - degrees Celsius  
mg/L - milligram per liter  
mm - millimeter  
ms/cm - milliseimens per centimeter  
mV - millivolts  
NTU - nephelometric turbidity units  
NV - not visible  
pH - pH units  
ppt - parts per thousand



TABLE 4  
Surface Sediment Screening  
Benthic Invertebrate Evaluation  
SWMU 3 Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Sample	Date	Grid	Area	Percent ABM	Copper (MG/KG)	RO	Lead (MG/KG)	RO	Nickel (MG/KG)	RO	Tin (MG/KG)	RO	Zinc (MG/KG)	RO	Average RO	Fails RO?	Reason for Failure	ABM > 1%?	Percent ABM	Classification
LW03-SD538-00-10C	9/1/2010	538	Dry Dock	1.0	165	0.71	50.1	0.47	25.4	0.96	9.48	0.85	313	0.76	0.75	NO	--	NO	--	Unimpacted
LW03-SD539-00-10C	9/1/2010	539	Dry Dock	0.5	206	0.89	40.4	0.38	28.8	1.09	10.7	0.96	349	0.85	0.83	NO	--	NO	--	Unimpacted
LW03-SD544-00-10C	9/1/2010	544	Dry Dock	0.5	156	0.67	45.5	0.43	27.2	1.03	8.46	0.76	267	0.65	0.71	NO	--	NO	--	Unimpacted
LW03-SD513-00-10C	9/10/2010	513	Marina	1.5	71.7	0.31	64.6	0.60	11.5	0.43	9.33	0.83	232	0.57	0.55	NO	--	YES	1.50	Possibly impacted
LW03-SD514-00-10C	9/10/2010	514	Marina	1.2	241	1.04	243	2.27	22.0	0.83	18.5	1.65	473	1.15	1.39	YES	Pb, Sn, Avg	YES	1.20	Impacted
LW03-SD515-00-10C	9/9/2010	515	Marina	5.0	221	0.95	123	1.15	18.1	0.68	12.8	1.14	395	0.96	0.98	NO	--	YES	5.00	Possibly impacted
LW03-SD519-00-10C	9/2/2010	519	Marina	0.4	112	0.48	52.4	0.49	17.3	0.65	9.78	0.87	240	0.59	0.62	NO	--	NO	--	Unimpacted
LW03-SD520-00-10C	9/10/2010	520	Marina	1.5	385	1.66	177	1.65	29.2	1.10	19.7	1.76	602	1.47	1.53	YES	Cu, Pb, Sn, Avg	YES	1.50	Impacted
LW03-SD521-00-10C	9/12/2010	521	Marina	5.0	367	1.58	209	1.95	30.6	1.15	16.7	1.49	711	1.73	1.58	YES	Cu, Pb, Zn, Avg	YES	5.00	Impacted
LW03-SD522-00-10C	9/9/2010	522	Marina	9.0	300	1.29	317	2.96	22.6	0.85	25.8	2.30	699	1.70	1.82	YES	Pb, Sn, Zn, Avg	YES	9.00	Impacted
LW03-SD525-00-10C	9/2/2010	525	Marina	0.6	179	0.77	54.5	0.51	22.7	0.86	7.86	0.70	281	0.69	0.70	NO	--	NO	--	Unimpacted
LW03-SD526-00-10C	9/10/2010	526	Marina	0.01	214	0.92	68.2	0.64	25.8	0.97	10.1	0.90	374	0.91	0.87	NO	--	NO	--	Unimpacted
LW03-SD527-00-10C	9/12/2010	527	Marina	2.0	271	1.17	201	1.88	24.4	0.92	14.4	1.29	500	1.22	1.29	YES	Pb, Avg	YES	2.00	Impacted
LW03-SD530-00-10C	9/2/2010	530	Marina	0.6	169	0.73	53.3	0.50	33.0	1.25	9.49	0.85	291	0.71	0.81	NO	--	NO	--	Unimpacted
LW03-SD501-00-10C	9/2/2010	501	Near Shore	0.1	38.7	0.17	45.0	0.42	3.44	0.13	3.79	0.34	62.3	0.15	0.24	NO	--	NO	--	Unimpacted
LW03-SD502-00-10C	9/2/2010	502	Near Shore	0.2	30.2	0.13	16.5	0.15	16.6	0.63	5.52	0.49	100	0.24	0.33	NO	--	NO	--	Unimpacted
LW03-SD503-00-10C	9/2/2010	503	Near Shore	0.1	40.4	0.17	52.6	0.49	5.01	0.19	4.44	0.40	86.3	0.21	0.29	NO	--	NO	--	Unimpacted
LW03-SD504-00-10C	8/31/2010	504	Near Shore	0.25	107	0.46	44.5	0.42	10.8	0.41	5.50	0.49	172	0.42	0.44	NO	--	NO	--	Unimpacted
LW03-SD504A-00-10C	8/31/2010	504A	Near Shore	0.5	142	0.61	47.1	0.44	17.5	0.66	6.18	0.55	226	0.55	0.56	NO	--	NO	--	Unimpacted
LW03-SD505-00-10C	8/31/2010	505	Near Shore	1.0	74.3	0.32	46.4	0.43	12.4	0.47	13.6	1.21	160	0.39	0.57	NO	--	NO	--	Unimpacted
LW03-SD506-00-10C	9/10/2010	506	Near Shore	2.0	18.6	0.08	21.2	0.20	3.63	0.14	4.25	0.38	87.4	0.21	0.20	NO	--	YES	2.00	Possibly impacted
LW03-SD507-00-10C	9/2/2010	507	Near Shore	0.05	27.0	0.12	21.5	0.20	5.10	0.19	6.01	0.54	68.0	0.17	0.24	NO	--	NO	--	Unimpacted
LW03-SD508-00-10C	9/10/2010	508	Near Shore	0.5	239	1.03	180	1.68	17.1	0.65	12.3	1.10	373	0.91	1.07	YES	Pb, Avg	NO	--	Possibly impacted
LW03-SD509-00-10C	9/9/2010	509	Near Shore	20	168	0.72	202	1.89	13.6	0.51	12.4	1.11	239	0.58	0.96	YES	Pb	YES	20.0	Impacted
LW03-SD516-00-10C	9/9/2010	516	Near Shore	50	1,400	6.03	1,050	9.81	298	11.2	300	26.8	4,850	11.8	13.1	YES	All	YES	50.0	Impacted
LW03-SD523-00-10C	9/9/2010	523	Near Shore	35	2,450	10.6	2,020	18.9	661	24.9	561	50.1	8,990	21.9	25.3	YES	All	YES	35.0	Impacted
LW03-SD529-00-10C	9/9/2010	529	Near Shore	15	935	4.03	399	3.73	169	6.38	151	13.5	1,600	3.90	6.30	YES	All	YES	15.0	Impacted
LW03-SD534-00-10C	9/1/2010	534	Near Shore	4.0	615	2.65	538	5.03	46.3	1.75	45.4	4.05	711	1.73	3.04	YES	All	YES	4.00	Impacted
LW03-SD535-00-10C	9/1/2010	535	Near Shore	20	431	1.86	253	2.36	55.5	2.09	31.3	2.79	886	2.16	2.25	YES	All	YES	20.0	Impacted
LW03-SD541-00-10C	9/7/2010	541	Near Shore	15	460	1.98	205	1.92	56.1	2.12	38.4	3.43	1,700	4.15	2.72	YES	All	YES	15.0	Impacted
LW03-SD547-00-10C	9/7/2010	547	Near Shore	22	525	2.26	129	1.21	29.8	1.12	22.5	2.01	687	1.68	1.66	YES	Cu, Sn, Zn, Avg	YES	22.0	Impacted
LW03-SD553-00-10C	9/7/2010	553	Near Shore	30	212	0.91	69.5	0.65	26.3	0.99	14.7	1.31	469	1.14	1.00	YES	Avg	YES	30.0	Impacted
LW03-SD559-00-10C	9/7/2010	559	Near Shore	18	127	0.55	140	1.31	15.6	0.59	6.66	0.59	302	0.74	0.76	NO	--	YES	18.0	Possibly impacted
LW03-SD510-00-10C	8/31/2010	510	Offshore	0.5	93.6	0.40	38.5	0.36	16.6	0.63	6.05	0.54	187	0.46	0.48	NO	--	NO	--	Unimpacted
LW03-SD511-00-10C	8/31/2010	511	Offshore	0.8	97.4	0.42	66.3	0.62	18.5	0.70	14.0	1.25	248	0.60	0.72	NO	--	NO	--	Unimpacted
LW03-SD512-00-10C	9/2/2010	512	Offshore	0.3	96.3	0.42	69.0	0.64	16.5	0.62	13.3	1.19	243	0.59	0.69	NO	--	NO	--	Unimpacted
LW03-SD517-00-10C	8/31/2010	517	Offshore	0.25	245	1.06	58.1	0.54	25.7	0.97	9.08	0.81	328	0.80	0.84	NO	--	NO	--	Unimpacted
LW03-SD518-00-10C	8/31/2010	518	Offshore	0.2	173	0.75	61.9	0.58	24.1	0.91	7.50	0.67	293	0.71	0.72	NO	--	NO	--	Unimpacted
LW03-SD528-00-10C	9/9/2010	528	Offshore	No data	323	1.39	250	2.34	33.6	1.27	27.9	2.49	616	1.50	1.80	YES	Pb, Sn, Zn, Avg	--	No data	Impacted
LW03-SD533-00-10C	9/1/2010	533	Offshore	5.0	237	1.02	167	1.56	52.2	1.97	34.2	3.05	673	1.64	1.85	YES	All but Cu	YES	5.00	Impacted
LW03-SD537-00-10C	9/1/2010	537	Offshore	3.0	231	1.00	179	1.67	27.8	1.05	15.5	1.38	1,030	2.51	1.52	YES	Pb, Zn, Avg	YES	3.00	Impacted

TABLE 4  
Surface Sediment Screening  
Benthic Invertebrate Evaluation  
SWMU 3 Pier 10 Sandblast Yard  
JEB Little Creek, Virginia Beach, Virginia

Sample	Date	Grid	Area	Percent ABM	Copper (MG/KG)	RQ	Lead (MG/KG)	RQ	Nickel (MG/KG)	RQ	Tin (MG/KG)	RQ	Zinc (MG/KG)	RQ	Average RQ	Fails RQ?	Reason for Failure	ABM > 1%?	Percent ABM	Classification
LW03-SD540-00-10C	9/1/2010	540	Offshore	4.0	334	1.44	238	2.22	63.0	2.38	40.0	3.57	852	2.08	2.34	YES	All but Cu	YES	4.00	Impacted
LW03-SD543-00-10C	9/1/2010	543	Offshore	1.5	151	0.65	62.3	0.58	28.0	1.06	9.35	0.83	344	0.84	0.79	NO	--	YES	1.50	Possibly impacted
LW03-SD545-00-10C	9/1/2010	545	Offshore	2.0	230	0.99	158	1.48	33.3	1.26	17.0	1.52	433	1.06	1.26	YES	Sn, Avg	YES	2.00	Impacted
LW03-SD546-00-10C	9/1/2010	546	Offshore	3.0	197	0.85	60.4	0.56	27.1	1.02	9.35	0.83	318	0.78	0.81	NO	--	YES	3.00	Possibly impacted
LW03-SD548-00-10C	9/9/2010	548	Offshore	0	161	0.69	55.1	0.51	26.9	1.02	8.31	0.74	340	0.83	0.76	NO	--	NO	--	Unimpacted
LW03-SD549-00-10C	9/9/2010	549	Offshore	0.01	218	0.94	126	1.18	36.8	1.39	22.0	1.96	595	1.45	1.38	YES	Sn, Avg	NO	--	Possibly impacted
LW03-SD550-00-10C	9/8/2010	550	Offshore	No data	53.1	0.23	16.4	0.15	8.72	0.33	2.89	0.26	102	0.25	0.24	NO	--	--	No data	Unimpacted
LW03-SD551-00-10C	9/8/2010	551	Offshore	0.3	110	0.47	167	1.56	23.3	0.88	7.97	0.71	258	0.63	0.85	YES	Pb	NO	--	Possibly impacted
LW03-SD552-00-10C	9/7/2010	552	Offshore	0.03	138	0.59	49.5	0.46	22.2	0.84	8.16	0.73	275	0.67	0.66	NO	--	NO	--	Unimpacted
LW03-SD555-00-10C	9/9/2010	555	Offshore	0.001	169	0.73	724	6.77	25.8	0.97	8.87	0.79	540	1.32	2.12	YES	Pb, Avg	NO	--	Possibly impacted
LW03-SD556-00-10C	9/8/2010	556	Offshore	0.02	167	0.72	93.4	0.87	24.6	0.93	11.3	1.01	377	0.92	0.89	NO	--	NO	--	Unimpacted
LW03-SD557-00-10C	9/8/2010	557	Offshore	0.03	145	0.63	50.2	0.47	27.8	1.05	8.89	0.79	302	0.74	0.73	NO	--	NO	--	Unimpacted
LW03-SD558-00-10C	9/8/2010	558	Offshore	0.4	201	0.87	76.6	0.72	34.3	1.29	16.6	1.48	449	1.10	1.09	YES	Avg	NO	--	Possibly impacted
LW03-SD562-00-10C	9/8/2010	562	Offshore	0.01	133	0.57	49.6	0.46	25.9	0.98	8.29	0.74	271	0.66	0.68	NO	--	NO	--	Unimpacted
LW03-SD563-00-10C	9/8/2010	563	Offshore	0.02	131	0.56	49.4	0.46	25.1	0.95	8.08	0.72	270	0.66	0.67	NO	--	NO	--	Unimpacted
LW03-SD564-00-10C	9/8/2010	564	Offshore	0.05	144	0.62	44.2	0.41	25.4	0.96	8.02	0.72	270	0.66	0.67	NO	--	NO	--	Unimpacted
LW03-SD567-00-10C	9/8/2010	567	Offshore	0.02	161	0.69	47.9	0.45	30.2	1.14	7.96	0.71	300	0.73	0.74	NO	--	NO	--	Unimpacted
LW03-SD571-00-10C	9/8/2010	571	Offshore	0.05	131	0.56	62.4	0.58	25.1	0.95	8.39	0.75	307	0.75	0.72	NO	--	NO	--	Unimpacted
LW03-SD574-00-10C	8/31/2010	574	Offshore	0.25	163	0.70	47.7	0.45	21.7	0.82	7.18	0.64	254	0.62	0.65	NO	--	NO	--	Unimpacted

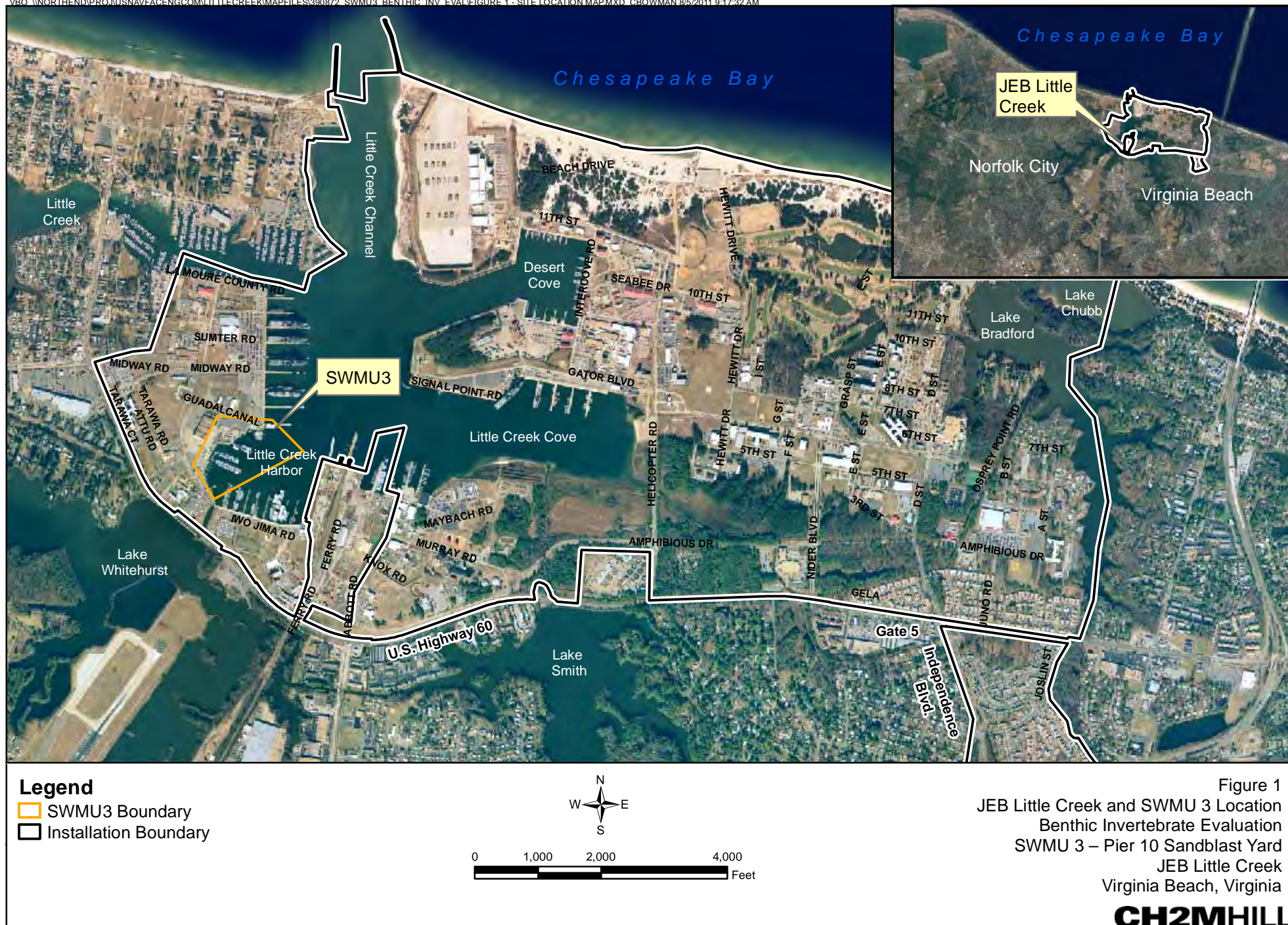
Notes:  
Shaded cells = detects  
Unshaded cells = U or B (at full DL)

	RQ ≤ 1 or 1.5		PRG	Basis
	RQ > 1.5 (Ind)	Copper	232	ABM
	RQ > 1 (Avg)	Lead	107	ABM
		Nickel	26.5	Back
		Tin	11.2	ABM
		Zinc	410	ER-M

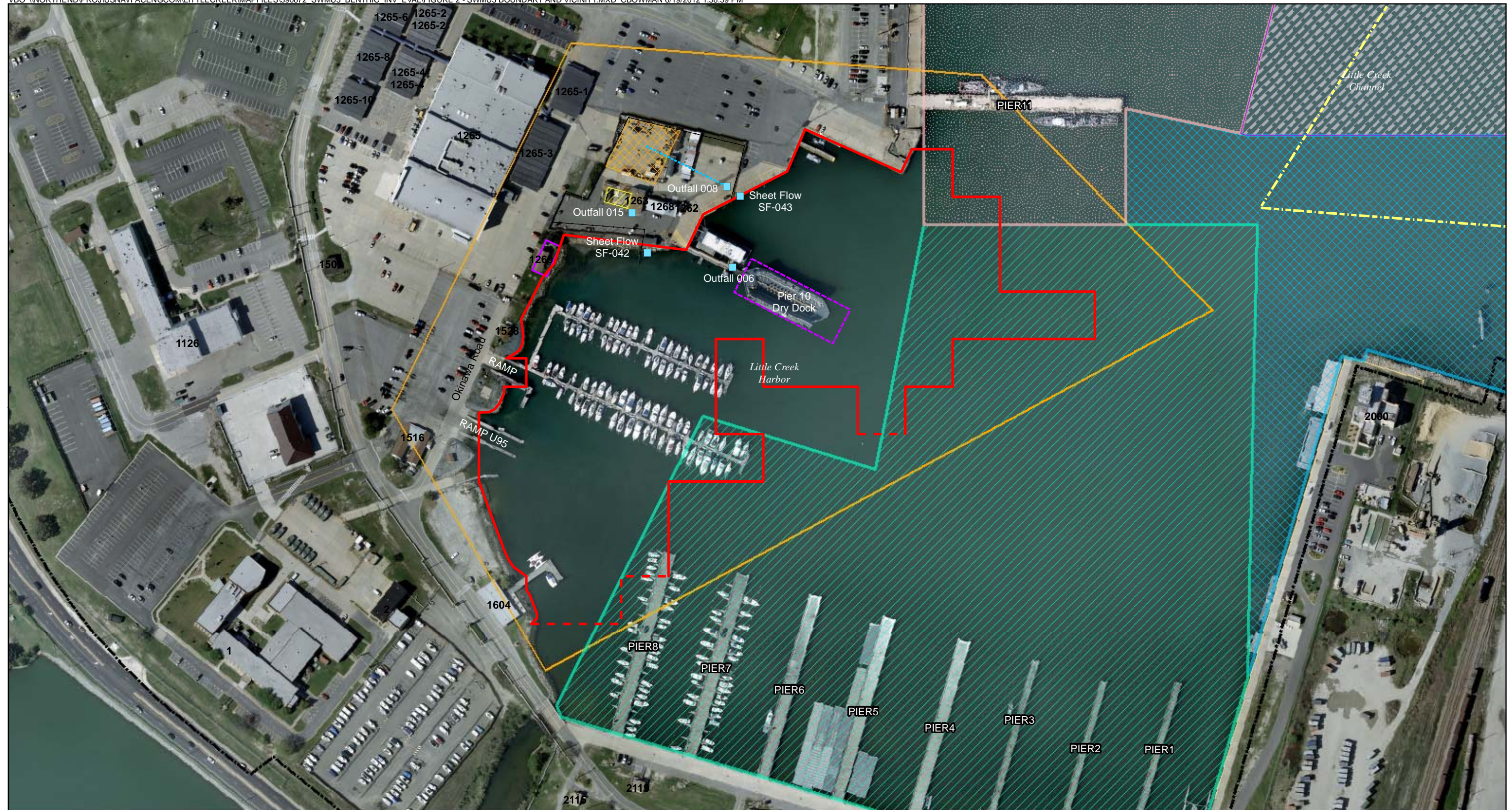
## Figures

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#### Legend

- Outfall Locations
- Underground Drain Pipe
- Area Dredged in 2010
- 1999 Dredging Limits
- Fenced Area
- 2009 Preliminary Impacted Sediment Lateral Boundary (dashed where inferred)
- Picnic Area
- SWMU 3 Investigation Boundary
- Former Sandblasting Area (1962-1995)
- More Recent Sandblasting Area (1995-1996)
- NAB Little Creek Dredge Maintenance to -18' mean low water (mlw)
- NAB Little Creek Dredge Maintenance to -20' mlw
- NAB Little Creek Dredge Maintenance to -25' mlw
- USACE Dredge Maintenance to -27' mlw

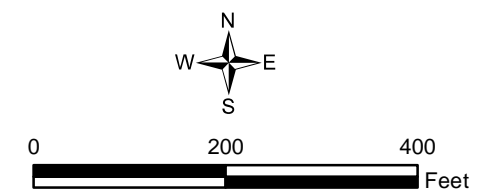


Figure 2  
SWMU 3 Boundary and Immediate Vicinity  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia



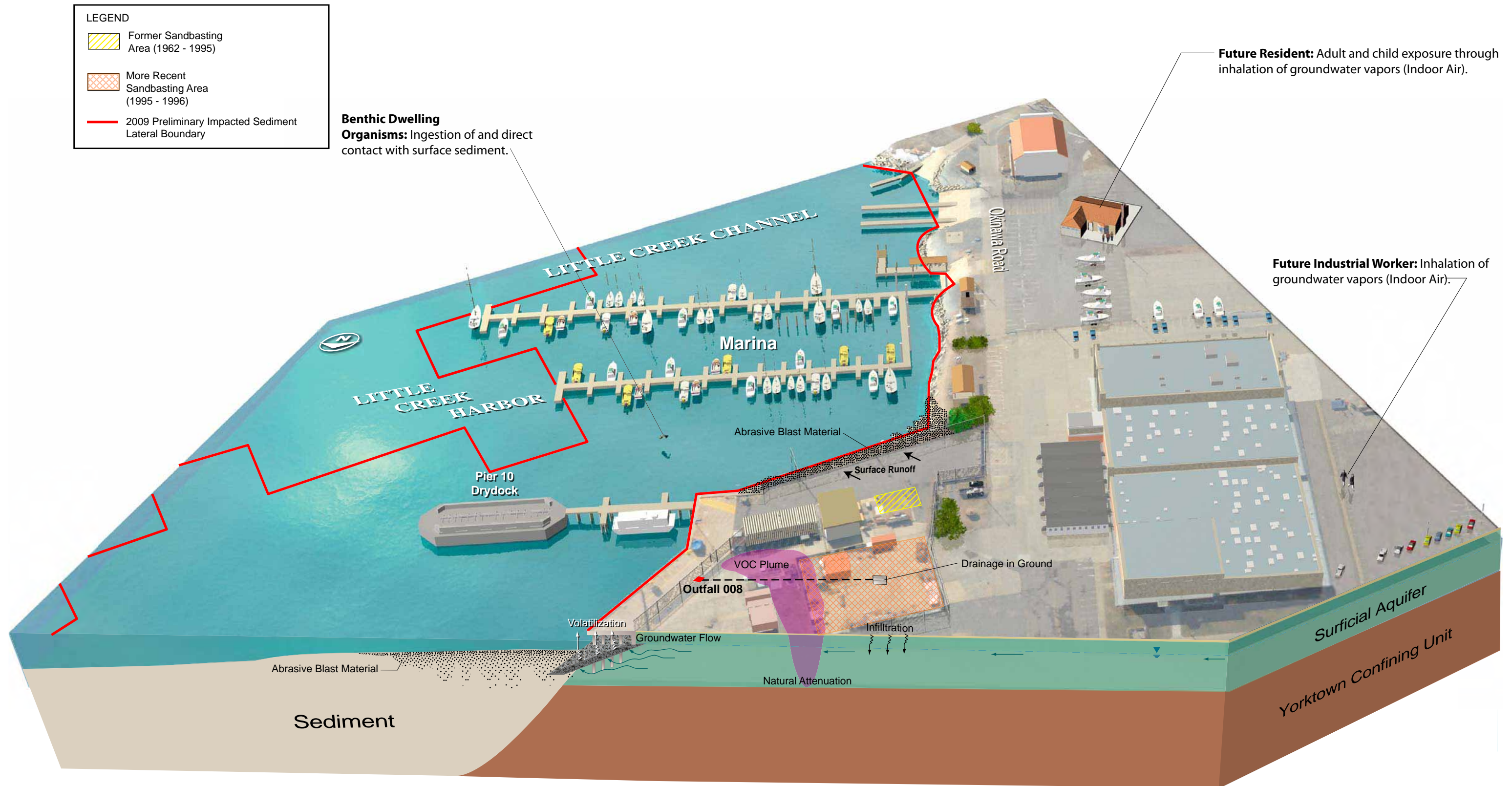
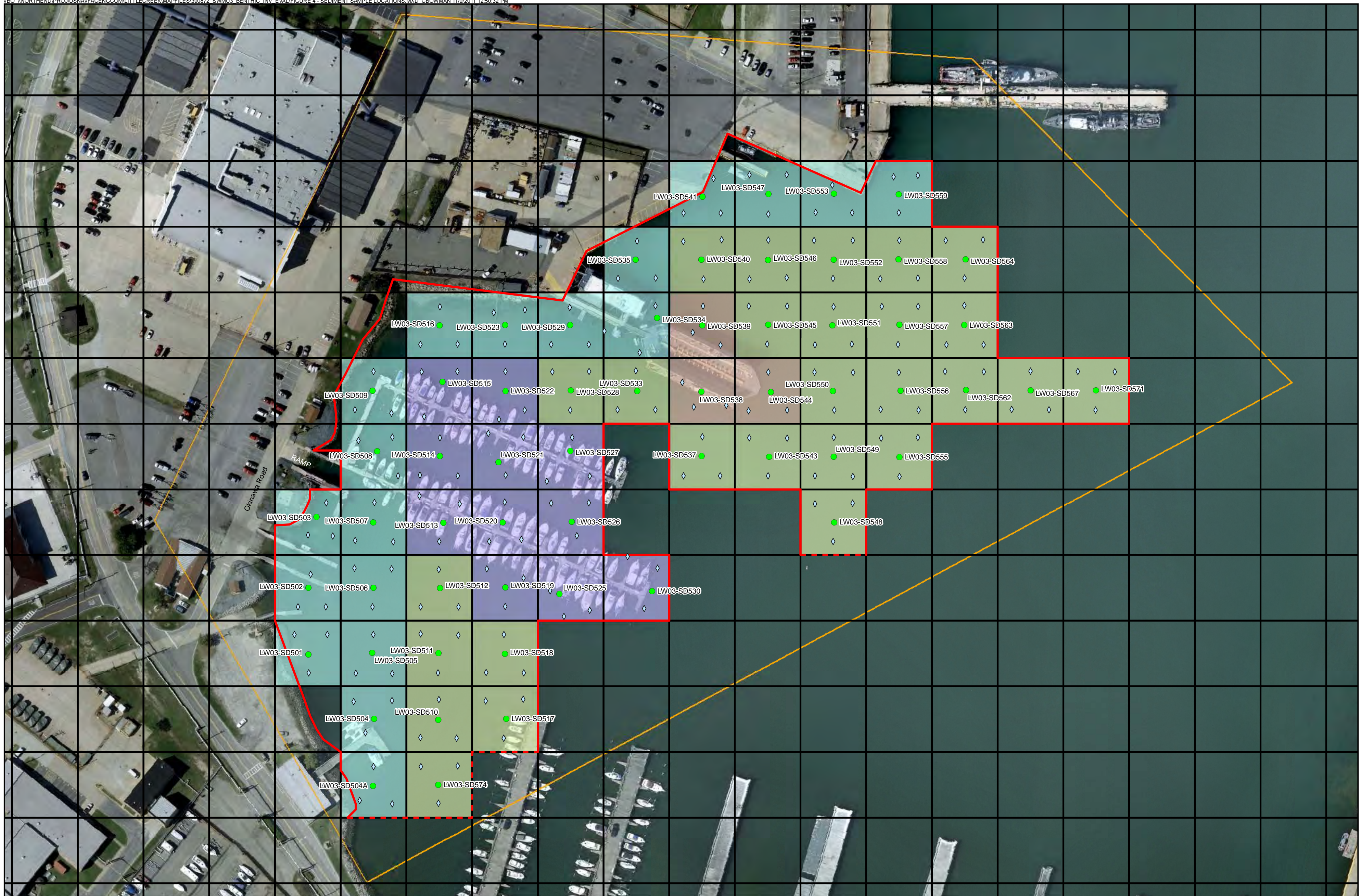


FIGURE 3  
 SWMU 3 Conceptual Site Model  
 Benthic Invertebrate Evaluation  
 SWMU 3 – Pier 10 Sandblast Yard  
 JEB Little Creek  
 Virginia Beach, Virginia





- Legend**
- 2010 Surface Water Quality Sample Locations
  - ◇ 2010 Composite Surface Sediment Sample Locations
  - SWMU 3 Boundary
  - 2009 Preliminary Impacted Sediment Lateral Boundary (dashed where inferred)

- Dry Dock Area
- Marina
- Near Shore
- Off Shore

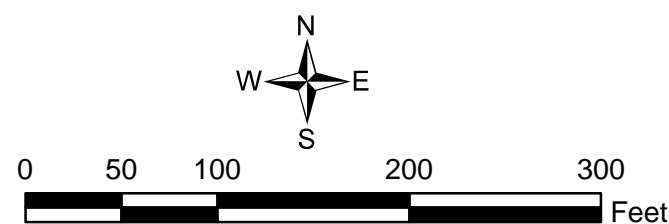


Figure 4  
Sample Locations  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia





- Legend**
- Background Sample Location
  - Reference Sample Location Area
  - 1999 Dredging Limits
  - Fenced Area
  - Picnic Area
  - SWMU 3 Investigation Boundary
  - Former Sandblasting Area (1962-1995)
  - More Recent Sandblasting Area (1995-1996)

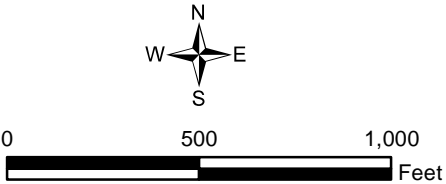
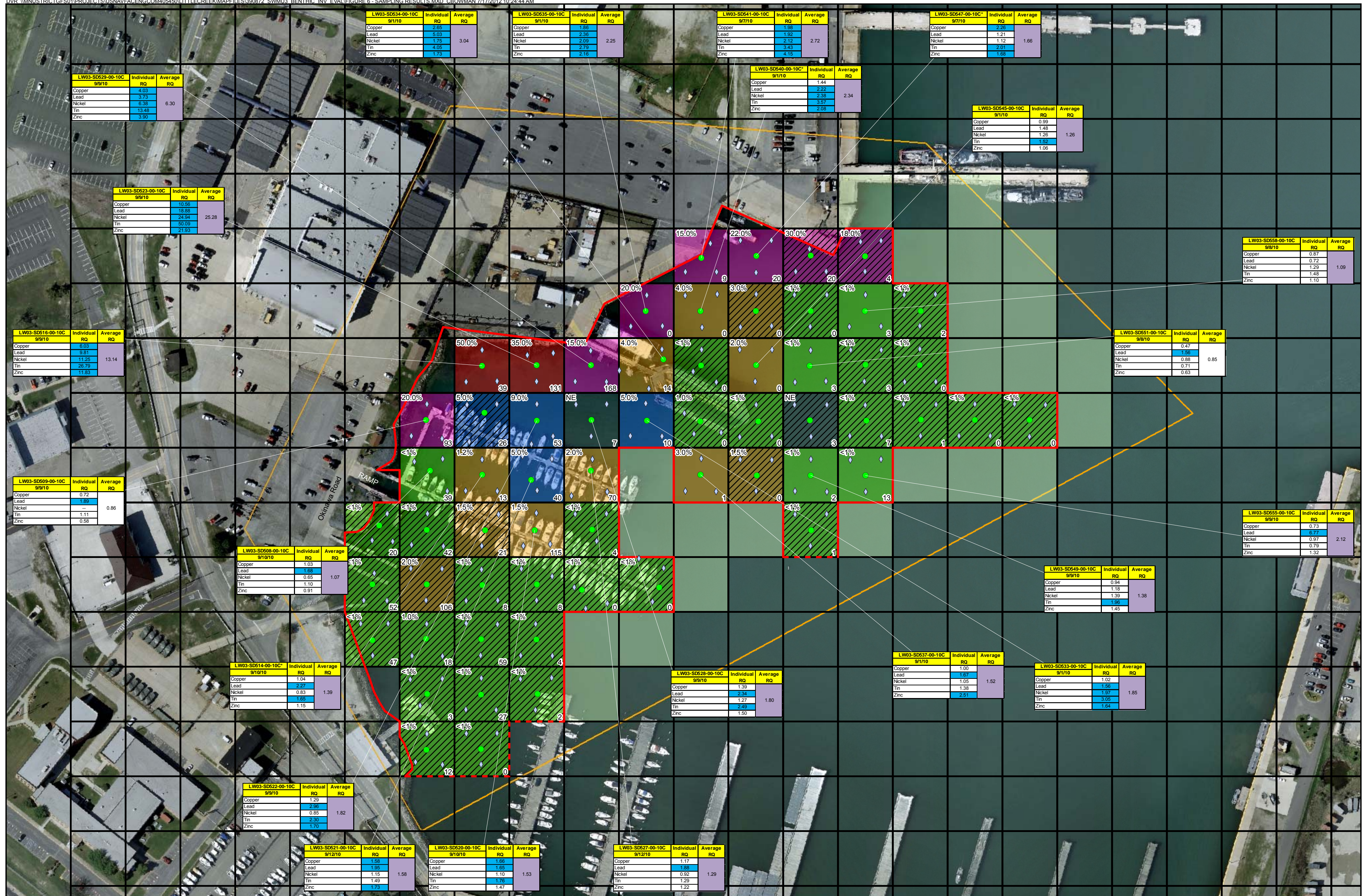


Figure 5  
Background Sediment Locations  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia







## **Attachment A**

### **Raw Data**

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TABLE A-1  
2010 Raw Analytical Data  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia

Sample ID	LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504-00-10C	LW03-SD504A-00-10C	LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD506P-00-10C	LW03-SD507-00-10C	LW03-SD508-00-10C	LW03-SD509-00-10C	LW03-SD510-00-10C
Sample Date	9/2/10	9/2/10	9/2/10	8/31/10	8/31/10	8/31/10	9/10/10	9/10/10	9/2/10	9/10/10	9/9/10	8/31/10
Chemical Name												
Total Metals (mg/kg)												
Copper	38.7	30.2	40.4	107	142	74.3	16.4	18.6	27	239	168 K	93.6
Lead	45	16.5	52.6	44.5	47.1	46.4	14.2	21.2	21.5	180	202	38.5
Nickel	3.44	16.6	5.01	10.8	17.5	12.4	3.63	3.46	5.1	17.1	13.6 B	16.6
Tin	3.79 B	5.52 B	4.44 B	5.5 B	6.18 B	13.6	4.25	3.97	6.01 B	12.3	12.4	6.05 B
Zinc	62.3 L	100 L	86.3 L	172	226 L	160 L	87.4 J	57.2 J	68 L	373	239	187 L
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)												
Acid volatile sulfide	125	116	1,180	70.6	62.4	190	16.4	NS	26.5	581	27.3	113
Cadmium	0.00137 J	0.192	0.543	0.00609	0.00402	0.00205 J	0.0017 J	NS	0.208	0.00336 J	9.24E-04 J	0.01
Copper	0.123	8.39	29.9	0.479	0.381	0.26	0.138	NS	11	0.875	0.491	1.02
Lead	0.116	11.4	33.2	0.148	0.119	0.11	0.0444	NS	11.5	0.487	0.14	0.188
Mercury	0.000108 U	0.000113 U	0.000159 U	0.0000573 U	0.000047 U	0.0000732 U	0.0000991 U	NS	0.0000634 U	0.000118 U	0.0000963 U	0.0000771 U
Nickel	0.0283 B	2.64	3	0.0659	0.0314 J	0.0629	0.027 J	NS	1.9	0.0997	0.103	0.0549
Silver	0.00517 U	0.00253 U	0.00356 U	0.00275 U	0.00226 U	0.00351 U	0.00476 U	NS	0.00142 U	0.00566 U	0.00216 U	0.0037 U
Zinc	0.835 L	56.1 L	131 L	2.88	2.01	2.09	0.658	NS	48.9 L	6.06	2.3 L	4.37
Wet Chemistry (PH)												
pH	8.16	8.31	7.9	7.87	7.14	7.85	8.07	NS	7.8	7.83	8.6	7.96
Total organic carbon (TOC)	4,010	12,200	5,060	21,500	29,300	5,520	1,810	NS	2,260 J	23,400	6,020	19,700
Grain Size (PCT/P)												
GS07 Sieve 1" (25.0 mm)	100	86	100	99	100	100	100	NS	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	86	100	98	100	100	97	NS	100	100	93	100
GS09 Sieve 0.5" (12.5 mm)	100	82	100	98	100	100	97	NS	100	100	85	100
Sieve No. 004 (4.75 mm)	99	71	99	97	98	100	97	NS	100	99	80	100
Sieve No. 010 (2.00 mm)	98	68	98	95	97	99	95	NS	99	99	78	100
Sieve No. 040 (425 µm)	75	56	79	83	94	88	53	NS	77	82	44	96
Sieve No. 100 (150 µm)	20	46	25	48	82	47	13	NS	18	42	17	87
Sieve No. 200 (75 µm)	10	42	15	27	55	23	8	NS	9	23	10	64

Notes:

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U - The material was analyzed for, but not detectec

UL - Analyte not detected, quantitation limit is probably highe

mg/kg - Milligrams per kilogram

PCT/P - Percent Passed

PH - pH units

µmol/g - Micromoles per gram

TABLE A-1  
2010 Raw Analytical Data  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia

Sample ID	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C	LW03-SD514P-00-10C	LW03-SD515-00-10C	LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C	LW03-SD520-00-10C	LW03-SD521-00-10C
Sample Date	8/31/10	9/2/10	9/10/10	9/10/10	9/10/10	9/9/10	9/9/10	8/31/10	8/31/10	9/2/10	9/10/10	9/12/10
Chemical Name												
Total Metals (mg/kg)												
Copper	97.4	96.3	71.7	241	241	221	1,400	245	173	112	385	367
Lead	66.3	69	64.6	243	216	123	1,050	58.1	61.9	52.4	177	209
Nickel	18.5	16.5	11.5	22	20.2	18.1	298	25.7	24.1	17.3	29.2	30.6
Tin	14	13.3	9.33	18.5	17.5	12.8	300	9.08	7.5 B	9.78	19.7	16.7
Zinc	248 L	243 L	232	473	467	395	4,850	328 L	293 L	240 L	602	711
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)												
Acid volatile sulfide	169	218	1,200	1,100	NS	467	16.1	139	465	1,330	8,080	728
Cadmium	0.00316 J	0.302	0.00564 J	0.00635 J	NS	0.00267 J	0.00159 J	0.0191	0.0125	0.842	0.00689 J	0.00722
Copper	0.522	21.6	2.04	1.62	NS	1.27	6.77	0.819	0.424	56.7	1.56	2.12
Lead	0.249	30.8	0.823	0.488	NS	0.403	1.87	0.211	0.195	36	0.2	0.634
Mercury	0.000074 U	0.000124 U	0.00014 U	0.000149 U	NS	0.000114 U	0.0000943 U	0.000147 U	0.000162 UL	0.000242 U	0.000388 U	0.00015 U
Nickel	0.105	6.44	0.203	0.132	NS	0.172	2.06	0.0803 J	0.0429 J	5.79	0.12 J	0.213
Silver	0.00355 U	0.00279 U	0.00672 U	0.00716 U	NS	0.00549 U	0.00211 U	0.00704 U	0.00779 U	0.00542 U	0.0186 U	0.00722 U
Zinc	3.42	136 L	9.82	5.05	NS	4.43	7.09	4.19	3.88	200 L	3.46	8.15
Wet Chemistry (PH)												
pH	7.31	8.24	7.92	8.03	NS	7.95	8.2	7.97	8.11	8.24	7.58	8.21
Total organic carbon (TOC)	11,500	7,220	6,710	17,500	NS	23,200	2,180	36,700	32,400	19,700	30,000	26,900
Grain Size (PCT/P)												
GS07 Sieve 1" (25.0 mm)	100	100	100	100	NS	100	100	100	100	100	92	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	NS	100	100	100	100	100	92	100
GS09 Sieve 0.5" (12.5 mm)	100	100	100	100	NS	100	96	100	100	100	90	100
Sieve No. 004 (4.75 mm)	100	100	96	99	NS	100	95	100	100	100	86	100
Sieve No. 010 (2.00 mm)	100	100	90	98	NS	96	93	100	100	100	76	95
Sieve No. 040 (425 um)	87	91	82	93	NS	80	45	99	99	92	66	88
Sieve No. 100 (150 um)	52	50	55	77	NS	33	9	94	93	72	57	76
Sieve No. 200 (75 um)	29	35	34	51	NS	19	4	88	86	59	49	60

Notes:

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mg/kg - Milligrams per kilogram  
PCT/P - Percent Passed  
PH - pH units  
µmol/g - Micromoles per gram

TABLE A-1  
2010 Raw Analytical Data  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia

Sample ID	LW03-SD522-00-10C	LW03-SD523-00-10C	LW03-SD525-00-10C	LW03-SD526-00-10C	LW03-SD526P-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C	LW03-SD533-00-10C	LW03-SD534-00-10C	LW03-SD535-00-10C
Sample Date	9/9/10	9/9/10	9/2/10	9/10/10	9/10/10	9/12/10	9/9/10	9/9/10	9/2/10	9/1/10	9/1/10	9/1/10
Chemical Name												
Total Metals (mg/kg)												
Copper	300	2,450 K	179	214	196	271	323	935	169	237	615	431
Lead	317	2,020	54.5	68.2	66	201	250	399	53.3	167	538	253
Nickel	22.6	661	22.7	25.8	24.1	24.4	33.6	169	33	52.2	46.3	55.5
Tin	25.8	561	7.86	10.1	8.88	14.4	27.9	151 L	9.49	34.2	45.4	31.3
Zinc	699	8,990	281 L	374	342	500	616	1,600	291 L	673 L	711 L	886 L
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)												
Acid volatile sulfide	384	1,220	750	3,190	NS	1,020	2,510	288	2,380	3,650	4,030	2,110
Cadmium	0.00302 J	0.00308	1.11	0.00999 J	NS	0.0127	0.00617 J	0.0057	1.43	0.0099 J	0.00861 J	0.00781 J
Copper	1.5	4.43	81.1	2.1	NS	2.12	1.97	2.6	69.3	1.29	1.24	2.82
Lead	0.652	1.01	36.1	0.233	NS	0.387	0.704	0.666	35.3	0.259	0.249	1.28
Mercury	0.000102 U	0.00013 U	0.000332 U	0.000443 U	NS	0.000259 U	0.000162 U	0.0000964 U	0.000407 U	0.00054 U	0.000518 U	0.000179 U
Nickel	0.38	1.11	3.53	0.14 J	NS	0.128 J	0.239	0.511	3.79	0.0921 J	0.0873 J	0.617
Silver	0.00492 U	0.0029 U	0.00744 U	0.0212 U	NS	0.0124 U	0.00778 U	0.00216 U	0.00912 U	0.0259 U	0.0249 U	0.00858 U
Zinc	8.62	9.24 L	219 L	4.37	NS	5.93	7.37	10.9	181 L	5.03	5.12	19.7
Wet Chemistry (PH)												
pH	7.78	8.83	8.14	8.01	NS	8.16	7.72	8.93	6.98	8.2	8.04	8.22
Total organic carbon (TOC)	8,130	5,770	35,500	35,300	NS	28,700	16,500	4,860	44,300	23,300	24,900	39,000
Grain Size (PCT/P)												
GS07 Sieve 1" (25.0 mm)	100	88	100	100	NS	100	100	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	88	100	100	NS	100	100	100	100	100	100	99
GS09 Sieve 0.5" (12.5 mm)	100	82	100	100	NS	100	100	99	100	100	100	99
Sieve No. 004 (4.75 mm)	100	75	100	100	NS	99	100	97	100	100	94	95
Sieve No. 010 (2.00 mm)	100	72	100	100	NS	91	99	92	100	99	91	93
Sieve No. 040 (425 µm)	83	36	91	99	NS	88	91	61	87	85	58	68
Sieve No. 100 (150 µm)	39	14	74	95	NS	84	70	16	73	64	36	54
Sieve No. 200 (75 µm)	23	7	69	93	NS	79	47	9	66	49	27	46

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PH - pH units

µmol/g - Micromoles per gram

TABLE A-1  
2010 Raw Analytical Data  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia

Sample ID	LW03-SD537-00-10C	LW03-SD538-00-10C	LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD540P-00-10C	LW03-SD541-00-10C	LW03-SD543-00-10C	LW03-SD544-00-10C	LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD547P-00-10C
Sample Date	9/1/10	9/1/10	9/1/10	9/1/10	9/1/10	9/7/10	9/1/10	9/1/10	9/1/10	9/1/10	9/7/10	9/7/10
Chemical Name												
Total Metals (mg/kg)												
Copper	231	165	206	334	283	460 K	151	156	230	197	161 K	525 K
Lead	179	50.1	40.4	214	238	205	62.3	45.5	158	60.4	83.4	129
Nickel	27.8	25.4	28.8	63	43.4	56.1	28	27.2	33.3	27.1	23.5	29.8
Tin	15.5	9.48	10.7	40	32	38.4	9.35	8.46	17	9.35	13.6	22.5
Zinc	1,030 L	313 L	349 L	852 L	699 L	1,700	344 L	267 L	433 L	318 L	467	687
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)												
Acid volatile sulfide	394	2,880	1,490	812	NS	4,280	88.5	2,460	1,710	1,530	4,260	NS
Cadmium	0.00781 J	0.00717 J	0.0386	0.00602 J	NS	0.935	0.0085 J	0.00755 J	0.00609 J	0.0413	1.42	NS
Copper	0.841	1.4	1.14	1.14	NS	61.8	0.702	1.27	0.912	1.09	86.7	NS
Lead	0.252	0.197	0.272	0.44	NS	97.3	0.2	0.194	0.234	0.225	57.1	NS
Mercury	0.000229 U	0.000466 U	0.000294 U	0.000164 U	NS	0.00022 U	0.000224 U	0.000483 U	0.00038 U	0.000303 U	0.000395 U	NS
Nickel	0.126 J	0.0766 J	0.13 J	0.158	NS	12.4	0.068 J	0.0742 J	0.19 J	0.061 J	7.12	NS
Silver	0.011 U	0.0223 U	0.0141 U	0.00787 U	NS	0.00494 U	0.0107 U	0.0232 U	0.0182 U	0.0146 U	0.00884 U	NS
Zinc	5.36	4.35	5.67	6.63	NS	445 L	3.55	3.82	5.06	4.32	273 L	NS
Wet Chemistry (PH)												
pH	8.66	7.94	7.09	8.13	NS	8.7	8.3	8.02	8.59	8.37	8.78	NS
Total organic carbon (TOC)	19,700	45,300	34,600	18,800	NS	42,800	29,100	38,800	24,300	23,000	22,100	NS
Grain Size (PCT/P)												
GS07 Sieve 1" (25.0 mm)	100	100	100	100	NS	100	100	100	100	100	100	NS
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	NS	100	100	100	100	100	100	NS
GS09 Sieve 0.5" (12.5 mm)	100	100	100	100	NS	100	100	100	100	100	100	NS
Sieve No. 004 (4.75 mm)	100	100	100	100	NS	95	100	100	100	100	97	NS
Sieve No. 010 (2.00 mm)	100	99	100	100	NS	92	100	100	100	100	94	NS
Sieve No. 040 (425 µm)	97	97	93	81	NS	68	99	100	98	96	55	NS
Sieve No. 100 (150 µm)	93	92	82	53	NS	46	97	97	94	92	35	NS
Sieve No. 200 (75 µm)	89	88	73	44	NS	38	94	95	91	90	33	NS

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SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia

Sample ID	LW03-SD548-00-10C	LW03-SD549-00-10C	LW03-SD550-00-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C	LW03-SD556-00-10C	LW03-SD556P-00-10C	LW03-SD557-00-10C	LW03-SD558-00-10C	LW03-SD559-00-10C
Sample Date	9/9/10	9/9/10	9/8/10	9/8/10	9/7/10	9/7/10	9/9/10	9/8/10	9/8/10	9/8/10	9/8/10	9/7/10
Chemical Name												
Total Metals (mg/kg)												
Copper	161	218	53.1 K	110 K	138 K	212 K	169	167 K	144 K	145 K	201 K	127 K
Lead	55.1	126	16.4	167	49.5	69.5	724	93.4	72	50.2	76.6	140
Nickel	26.9	36.8	8.72 B	23.3	22.2	26.3	25.8	24.4	24.6	27.8	34.3	15.6 B
Tin	8.31	22	2.89	7.97	8.16	14.7	8.87	11.3	9.72	8.89	16.6	6.66
Zinc	340	595	102	258	275	469	540	377	314	302	449	302
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)												
Acid volatile sulfide	2,440	900	695	347	735	585	740	1,030	NS	1,480	619	806
Cadmium	0.00682	0.00618	0.00703	0.00587	0.00846	0.00315	0.00754	0.00845	NS	0.00762	0.00764	0.00234
Copper	1.25	1.13	1.51	1.29	1.94	1.78	1.13 L	5.49	NS	1.71	1.79	0.767
Lead	0.136	0.179	0.294	0.294	0.247	0.18	0.231 L	0.412	NS	0.327	0.303	0.163
Mercury	0.000362 U	0.000248 U	0.000213 U	0.000196 U	0.000274 U	0.000142 U	0.000248 U	0.000257 U	NS	0.000288 U	0.000326 U	0.00013 U
Nickel	0.103	0.117	0.219	0.225	0.142	0.118	0.157 J	0.199	NS	0.192	0.207	0.0531
Silver	0.0081 U	0.00555 U	0.00476 U	0.00439 U	0.00614 U	0.00319 U	0.00555 U	0.00576 U	NS	0.00646 U	0.00731 U	0.00291 U
Zinc	2.89	3.39	5.69	4.6	5.12	3.39	3.43 K	5.47	NS	5.03	5.04	2.01
Wet Chemistry (PH)												
pH	8.89	7.96	8.6	8.94	8.77	8.9	8.21	8.65	NS	8.41	8.72	8.86
Total organic carbon (TOC)	36,000	22,700	33,200	25,800	37,600	43,200	32,300	24,400	NS	36,700	33,900	25,900
Grain Size (PCT/P)												
GS07 Sieve 1" (25.0 mm)	100	100	100	100	100	85	100	100	NS	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	100	82	100	100	NS	100	100	100
GS09 Sieve 0.5" (12.5 mm)	100	100	100	100	100	82	100	100	NS	100	100	100
Sieve No. 004 (4.75 mm)	100	100	100	100	100	77	100	100	NS	100	100	100
Sieve No. 010 (2.00 mm)	100	100	100	100	100	73	100	100	NS	100	99	100
Sieve No. 040 (425 µm)	98	96	86	94	98	41	90	90	NS	96	93	91
Sieve No. 100 (150 µm)	92	84	59	80	92	21	80	82	NS	82	90	74
Sieve No. 200 (75 µm)	82	76	53	69	88	17	73	76	NS	77	87	56

Notes:

B - Analyte not detected above the level reported in associated blanks  
J - Analyte present. Value may or may not be accurate or precise

K - Analyte present. Value may be biased high. Value may be lower

L - Analyte present. Value may be biased low. Value may be higher  
NS - Not sampled

U - The material was analyzed for, but not detectec

UL - Analyte not detected, quantitation limit is probably highe

mg/kg - Milligrams per kilogram

PCT/P - Percent Passed

PH - pH units

µmol/g - Micromoles per gram

TABLE A-1  
2010 Raw Analytical Data  
Benthic Invertebrate Evaluation  
SWMU 3 - Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia

Sample ID	LW03-SD562-00-10C	LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C	LW03-SD571-00-10C	LW03-SD574-00-10C
Sample Date	9/8/10	9/8/10	9/8/10	9/8/10	9/8/10	8/31/10
Chemical Name						
Total Metals (mg/kg)						
Copper	133 K	131 K	144 K	161 K	131 K	163
Lead	49.6	49.4	44.2	47.9	62.4	47.7
Nickel	25.9	25.1	25.4	30.2	25.1	21.7
Tin	8.29	8.08	8.02	7.96	8.39	7.18 B
Zinc	271	270	270	300	307	254 L
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)						
Acid volatile sulfide	1,700	1,750	1,560	2,280	1,730	83.1
Cadmium	0.0063 J	0.00648	0.00855	0.00712	0.00576	0.00691
Copper	0.89	1.59	2.29	1.35	1.41	0.587
Lead	0.127	0.201	0.209	0.153	0.157	0.14
Mercury	0.00037 U	0.00034 U	0.000351 U	0.000331 U	0.000324 U	0.0000677 U
Nickel	0.119	0.161	0.178	0.13	0.125	0.049
Silver	0.00828 U	0.00762 U	0.00787 U	0.00742 U	0.00727 U	0.00325 U
Zinc	2.87	3.66	4.6	3.07	3.04	3.17
Wet Chemistry (PH)						
pH	8.8	8.86	8.58	8.03	8.61	7.59
Total organic carbon (TOC)	38,100	28,900	29,800	27,600	23,600	35,000
Grain Size (PCT/P)						
GS07 Sieve 1" (25.0 mm)	100	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	100	100
GS09 Sieve 0.5" (12.5 mm)	100	100	100	100	100	100
Sieve No. 004 (4.75 mm)	100	100	100	100	100	100
Sieve No. 010 (2.00 mm)	100	100	100	100	100	100
Sieve No. 040 (425 µm)	99	98	98	98	98	99
Sieve No. 100 (150 µm)	97	91	93	92	90	91
Sieve No. 200 (75 µm)	95	88	91	90	85	86

Notes:

- B - Analyte not detected above the level reported in associated blanks  
J - Analyte present. Value may or may not be accurate or precise
- K - Analyte present. Value may be biased high. Value may be lower
- L - Analyte present. Value may be biased low. Value may be higher  
NS - Not sampled  
U - The material was analyzed for, but not detectec  
UL - Analyte not detected, quantitation limit is probably highe  
mg/kg - Milligrams per kilogram  
PCT/P - Percent Passed  
PH - pH units  
µmol/g - Micromoles per gram



**Attachment B**  
**Data Validation Report**

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## Data Validation Summary

### CTO-222 Little Creek

TO: Anita Dodson/VBO  
Megan Morrison/WDC

FROM: Tiffany McGlynn/GNV

CC: Herb Kelly/GNV

DATE: November 8, 2010

#### Introduction

The following data validation report discusses the data validation process and findings for Empirical Laboratories, LLC for SDG 1009022.

Samples were analyzed using the following analytical methods:

- SW6010B Total Metals
- SEM Metals
- SW7470A/7471 Mercury

The samples included in this SDG are listed in the table below.

Sample Name	Lab Sample ID
LW03-SD504A-00-10C	1009022-01
LW03-SD504A-00-10C	1009022-02
LW03-SD574-00-10C	1009022-03
LW03-SD574-00-10C	1009022-04
LW03-SD504-00-10C	1009022-05
LW03-SD504-00-10C	1009022-06
LW03-SD510-00-10C	1009022-07
LW03-SD510-00-10C	1009022-08
LW03-SD517-00-10C	1009022-09
LW03-SD517-00-10C	1009022-10
LW03-SD518-00-10C	1009022-11

Sample Name	Lab Sample ID
LW03-SD518-00-10C	1009022-12
LW03-SD511-00-10C	1009022-13
LW03-SD511-00-10C	1009022-14
LW03-SD505-00-10C	1009022-15
LW03-SD505-00-10C	1009022-16
LW03-SD534-00-10C	1009022-17
LW03-SD534-00-10C	1009022-18
LW03-SD538-00-10C	1009022-19
LW03-SD538-00-10C	1009022-20
LW03-SD537-00-10C	1009022-21
LW03-SD537-00-10C	1009022-22
LW03-SD533-00-10C	1009022-23
LW03-SD533-00-10C	1009022-24
LW03-SD539-00-10C	1009022-25
LW03-SD539-00-10C	1009022-26
LW03-SD544-00-10C	1009022-27
LW03-SD544-00-10C	1009022-28
LW03-SD546-00-10C	1009022-29
LW03-SD546-00-10C	1009022-30
LW03-SD535-00-10C	1009022-31
LW03-SD535-00-10C	1009022-32
LW03-SD545-00-10C	1009022-33
LW03-SD545-00-10C	1009022-34
LW03-SD543-00-10C	1009022-35
LW03-SD543-00-10C	1009022-36
LW03-SD540-00-10C	1009022-37
LW03-SD540-00-10C	1009022-38
LW03-EB01-090110	1009022-39
LW03-SD540P-00-10C	1009022-40

## Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: National Functional Guidelines for Inorganic Methods Data Review (EPA 2004) and Region III Modifications for Inorganic Data Review (EPA 1993), as applicable. The samples were evaluated based on the following criteria:

- Data Completeness

- Technical Holding Times
- Initial/Continuing Calibrations
- Blanks
- Internal Standards
- Serial Dilutions
- Laboratory Control Samples
- Matrix Spike Recoveries
- Field Duplicates
- Identification/Quantitation
- Reporting Limits

## **Overall Evaluation of Data/Potential Usability Issues**

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

### **Data Completeness**

The SDG was received complete and intact. Resubmissions were not required.

### **Technical Holding Times**

According to the chain of custody records, sampling was performed on 8/31/10 and 9/1/10. Samples were received at the laboratory on 9/2/10. All sample preparation analysis was performed within holding time requirements.

### **Calibration**

Continuing calibration was below criteria for all zinc results for total metals. See table below for recoveries. Affected data are summarized in **Attachment 1**.

<u>CCV</u>	<u>Compound</u>	<u>Recovery</u>
0I25907-CCV4	Zinc	88.4%
0I25907-CCV5	Zinc	86.2%
0I25907-CCV6	Zinc	86.1%

### Blanks

Various compounds were detected in the equipment blank, and method blanks for both total metals and SEM metals as indicated below. Affected data are summarized in **Attachment 1**.

Lab case narrative noted nickel and zinc results in the equipment blank were qualified as Z-01 because sample containers were contaminated with acid containing nickel and zinc.

<b>Blank ID</b>	<b>Compound</b>	<b>Conc.</b>	<b>Units</b>	<b>Action Level</b>	<b>Units</b>
LW03-EB01-090110	Copper	1.65	ug/l	0.4125	mg/kg
LW03-EB01-090110	Lead	0.827	ug/l	0.20675	mg/kg
LW03-EB01-090110	Nickel	48.5	ug/l	12.125	mg/kg
MB-0I14011	Tin	1.44	mg/kg	7.2	mg/kg
MB-0I14012	Tin	1.45	mg/kg	7.25	mg/kg
LW03-EB01-090110	Zinc	8.27	ug/l	2.0675	mg/kg
AVS 0I14025-BLK	Lead	0.000417	umoles/g	0.002085	umoles/g
AVS 0I10001-BLK	Zinc	0.00249	umoles/g	0.01245	umoles/g
AVS 0I14025-BLK	Zinc	0.00212	umoles/g	0.0106	umoles/g

### Matrix Spike/Spike Duplicate

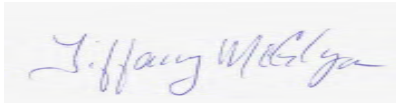
Mercury exhibited low recoveries for the MS/MSD (73.4/71.4%) for sample LW03-SD518-00-10C-SEM. Affected data are summarized in **Attachment 1**.

## **Conclusion**

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,

A handwritten signature in blue ink, reading "Tiffany McGlynn", is displayed within a light gray rectangular box.

Tiffany McGlynn

## Qualification Flags

Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.

## Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation



Value	Description
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

## Data Validation Summary

### CTO-222 Little Creek

TO: Anita Dodson/VBO  
Megan Morrison/WDC

FROM: Tiffany McGlynn/GNV

CC: Herb Kelly/GNV

DATE: November 8, 2010

#### Introduction

The following data validation report discusses the data validation process and findings for Empirical Laboratories, LLC for SDG 1009032.

Samples were analyzed using the following analytical methods:

- SW6010B Total Metals
- SEM Metals
- SW7470A/7471 Mercury

The samples included in this SDG are listed in the table below.

Sample Name	Lab Sample ID
LW03-SD501-00-10C	1009032-01
LW03-SD501-00-10C	1009032-02
LW03-SD502-00-10C	1009032-03
LW03-SD502-00-10C	1009032-04
LW03-SD503-00-10C	1009032-05
LW03-SD503-00-10C	1009032-06
LW03-SD530-00-10C	1009032-07
LW03-SD530-00-10C	1009032-08
LW03-SD525-00-10C	1009032-09
LW03-SD525-00-10C	1009032-10
LW03-SD519-00-10C	1009032-11

Sample Name	Lab Sample ID
LW03-SD519-00-10C	1009032-12
LW03-SD512-00-10C	1009032-13
LW03-SD512-00-10C	1009032-14
LW03-SD507-00-10C	1009032-15
LW03-SD507-00-10C	1009032-16

## Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: National Functional Guidelines for Inorganic Methods Data Review (EPA 2004) and Region III Modifications for Inorganic Data Review (EPA 1993), as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Initial/Continuing Calibrations
- Blanks
- Internal Standards
- Serial Dilutions
- Laboratory Control Samples
- Matrix Spike Recoveries
- Field Duplicates
- Identification/Quantitation
- Reporting Limits

## Overall Evaluation of Data/Potential Usability Issues

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

### Data Completeness

The SDG was received complete and intact. Resubmissions were not required.

### Technical Holding Times

According to the chain of custody records, sampling was performed on 9/2/10. Samples were received at the laboratory on 9/3/10. All sample preparation analysis was performed within holding time requirements.

### Calibration

Continuing calibration was below criteria for all zinc results for total and SEM metals. See table below for recoveries. Affected data are summarized in **Attachment 1**.

<u>CCV</u>	<u>Compound</u>	<u>Recovery</u>
0I25907-CCV4	Zinc	88.4%
0I25907-CCV5	Zinc	86.2%
0I25907-CCV6	Zinc	86.1%
I 26609-CCV5	Zinc	89.5%
I 26609-CCV6	Zinc	87.5%

### Blanks

Various compounds were detected in the equipment blank, method blanks, and calibration blanks for both total metals and SEM metals as indicated below. Affected data are summarized in **Attachment 1**.

Lab case narrative noted nickel and zinc results in the equipment blank were qualified as Z-01 because sample containers were contaminated with acid containing nickel and zinc.

Blank ID	Compound	Conc.	Units	Action Level	Units
LW03-EB01-090110	Copper	1.65	ug/l	0.4125	mg/kg
LW03-EB01-090110	Lead	0.827	ug/l	0.20675	mg/kg

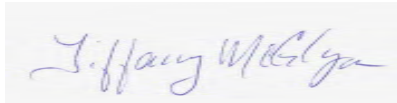
Blank ID	Compound	Conc.	Units	Action Level	Units
LW03-EB01-090110	Nickel	48.5	ug/l	12.125	mg/kg
MB-0I14011	Tin	1.44	mg/kg	7.2	mg/kg
MB-0I14012	Tin	1.45	mg/kg	7.25	mg/kg
LW03-EB01-090110	Zinc	8.27	ug/l	2.0675	mg/kg
0I23010-BLK1 SEM	Cadmium	0.0169	umoles/g	0.0845	umoles/g
0I23010-BLK1 SEM	Copper	0.0123	umoles/g	0.0615	umoles/g
0I23010-BLK1 SEM	Lead	0.0008	umoles/g	0.004	umoles/g
AVS 0I14025	Lead	0.000417	umoles/g	0.002085	umoles/g
0I23010-BLK1 SEM	Nickel	0.0226	umoles/g	0.113	umoles/g
0I23010-BLK1 SEM	Silver	0.00383	umoles/g	0.01915	umoles/g
AVS 0I14025	Zinc	0.00249	umoles/g	0.01245	umoles/g

## **Conclusion**

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,

A handwritten signature in blue ink, reading "Tiffany McGlynn", is displayed within a light gray rectangular box.

Tiffany McGlynn

## Qualification Flags

Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.

## Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation



Value	Description
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

## Data Validation Summary

### CTO-222 Little Creek

TO: Anita Dodson/VBO  
Megan Morrison/WDC  
FROM: Tiffany McGlynn/GNV  
CC: Herb Kelly/GNV  
DATE: November 8, 2010

#### Introduction

The following data validation report discusses the data validation process and findings for Empirical Laboratories, LLC for SDG 1009060.

Samples were analyzed using the following analytical methods:

- SW6010B Total Metals
- SEM Metals
- SW7470A/7471 Mercury

The samples included in this SDG are listed in the table below.

Sample Name	Lab Sample ID
LW03-SD541-00-10C	1009060-01
LW03-SD541-00-10C	1009060-02
LW03-SD547-00-10C	1009060-03
LW03-SD547-00-10C	1009060-04
LW03-SD547P-00-10C	1009060-05
LW03-SD553-00-10C	1009060-06
LW03-SD553-00-10C	1009060-07
LW03-SD559-00-10C	1009060-08
LW03-SD559-00-10C	1009060-09
LW03-SD552-00-10C	1009060-10
LW03-SD552-00-10C	1009060-11

Sample Name	Lab Sample ID
LW03-SD558-00-10C	1009060-12
LW03-SD558-00-10C	1009060-13
LW03-SD564-00-10C	1009060-14
LW03-SD564-00-10C	1009060-15
LW03-SD551-00-10C	1009060-16
LW03-SD551-00-10C	1009060-17
LW03-SD557-00-10C	1009060-18
LW03-SD557-00-10C	1009060-19
LW03-SD563-00-10C	1009060-20
LW03-SD563-00-10C	1009060-21
LW03-SD550-00-10C	1009060-22
LW03-SD550-00-10C	1009060-23
LW03-SD556-00-10C	1009060-24
LW03-SD556-00-10C	1009060-25
LW03-SD556P-00-10C	1009060-26
LW03-SD562-00-10C	1009060-27
LW03-SD562-00-10C	1009060-28
LW03-SD567-00-10C	1009060-29
LW03-SD567-00-10C	1009060-30
LW03-SD571-00-10C	1009060-31
LW03-SD571-00-10C	1009060-32
LW03-EB01-090810	1009060-33

## Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: National Functional Guidelines for Inorganic Methods Data Review (EPA 2004) and Region III Modifications for Inorganic Data Review (EPA 1993), as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Initial/Continuing Calibrations
- Blanks
- Internal Standards
- Serial Dilutions
- Laboratory Control Samples

- Matrix Spike Recoveries
- Field Duplicates
- Identification/Quantitation
- Reporting Limits

## **Overall Evaluation of Data/Potential Usability Issues**

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

### **Data Completeness**

The SDG was received complete and intact. Resubmissions were not required.

### **Technical Holding Times**

According to the chain of custody records, sampling was performed on 9/7/10 and 9/8/10. Samples were received at the laboratory on 9/9/10. All sample preparation analysis was performed within holding time requirements.

### **Calibration**

Continuing calibration was above criteria at 111% for CCV3 and CCV4 for copper in total metals. For SEM metals, the continuing calibration for zinc was below criteria, CCV5 89.5% and CCV6 87.5%. Criteria for continuing calibration is 90-110%. Affected data are summarized in **Attachment 1**.

### **Blanks**

Various compounds were detected in the equipment blank, method blanks, and calibration blanks for both total metals and SEM metals as indicated below. Affected data are summarized in **Attachment 1**.

Lab case narrative noted nickel and zinc results in the equipment blank were qualified as Z-01 because sample containers were contaminated with acid containing nickel and zinc.

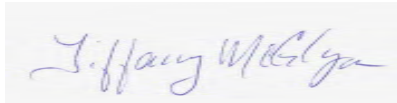
Blank ID	Compound	Conc.	Units	Action Level	Units
LW03-EB01-090810	Copper	1.83	ug/L	0.4575	mg/kg
LW03-EB01-090810	Lead	1.11	ug/L	0.2775	mg/kg
LW03-EB01-090810	Nickel	64.6	ug/L	16.15	mg/kg
LW03-EB01-090810	Tin	1.4	ug/L	0.35	mg/kg
LW03-EB01-090810	Zinc	8.61	ug/L	2.1525	mg/kg
0J27402-CCB4	Zinc	5.27	ug/L	1.3175	mg/kg
0I23010-BLK1 SEM	Cadmium	0.0169	umoles/g	0.0845	umoles/g
0I23010-BLK1 SEM	Copper	0.0123	umoles/g	0.0615	umoles/g
0I23010-BLK1 SEM	Lead	0.0008	umoles/g	0.004	umoles/g
0J01005	Lead	0.000694	umoles/g	0.00347	umoles/g
0I23010-BLK1 SEM	Nickel	0.0226	umoles/g	0.113	umoles/g
0I23010-BLK1 SEM	Silver	0.00383	umoles/g	0.01915	umoles/g
0J01005	Zinc	0.00242	umoles/g	0.0121	umoles/g

## **Conclusion**

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,

A handwritten signature in blue ink, reading "Tiffany McGlynn", is displayed within a light gray rectangular box.

Tiffany McGlynn

## Qualification Flags

Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.

## Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation



Value	Description
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

## Data Validation Summary

### CTO-222 Little Creek

TO: Anita Dodson/VBO  
Megan Morrison/WDC  
FROM: Tiffany McGlynn/GNV  
CC: Herb Kelly/GNV  
DATE: November 8, 2010

#### Introduction

The following data validation report discusses the data validation process and findings for Empirical Laboratories, LLC for SDG 1009086.

Samples were analyzed using the following analytical methods:

- SW6010B Total Metals
- SEM Metals
- SW7470A/7471 Mercury

The samples included in this SDG are listed in the table below.

Sample Name	Lab Sample ID
LW03-SD523-00-10C	1009086-01
LW03-SD523-00-10C	1009086-02
LW03-SD509-00-10C	1009086-03
LW03-SD509-00-10C	1009086-04
LW03-SD516-00-10C	1009086-05
LW03-SD516-00-10C	1009086-06
LW03-SD529-00-10C	1009086-07
LW03-SD529-00-10C	1009086-08
LW03-SD548-00-10C	1009086-09
LW03-SD548-00-10C	1009086-10
LW03-SD549-00-10C	1009086-11

Sample Name	Lab Sample ID
LW03-SD549-00-10C	1009086-12
LW03-SD555-00-10C	1009086-13
LW03-SD555-00-10C	1009086-14
LW03-SD515-00-10C	1009086-15
LW03-SD515-00-10C	1009086-16
LW03-SD522-00-10C	1009086-17
LW03-SD522-00-10C	1009086-18
LW03-SD528-00-10C	1009086-19
LW03-SD528-00-10C	1009086-20
LW03-SD506-00-10C	1009086-21
LW03-SD506-00-10C	1009086-22
LW03-SD506P-00-10C	1009086-23
LW03-SD513-00-10C	1009086-24
LW03-SD513-00-10C	1009086-25
LW03-SD526-00-10C	1009086-26
LW03-SD526-00-10C	1009086-27
LW03-SD526P-00-10C	1009086-28
LW03-SD520-00-10C	1009086-29
LW03-SD520-00-10C	1009086-30
LW03-SD514-00-10C	1009086-31
LW03-SD514-00-10C	1009086-32
LW03-SD514P-00-10C	1009086-33
LW03-SD508-00-10C	1009086-34
LW03-SD508-00-10C	1009086-35
LW07-H1-SD401-00-10C	1009086-36
LW07-H1-SD401-00-10C	1009086-37
LW07-K1-SD401-00-10C	1009086-38
LW07-K1-SD401-00-10C	1009086-39
LW07-M1-SD401-00-10C	1009086-40
LW07-M1-SD401-00-10C	1009086-41
LW07-SD404-00-10C	1009086-42
LW07-SD404-00-10C	1009086-43
LW07-EB01-091010	1009086-44

## Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: National Functional Guidelines for Inorganic Methods Data

Review (EPA 2004) and Region III Modifications for Inorganic Data Review (EPA 1993), as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Initial/Continuing Calibrations
- Blanks
- Internal Standards
- Serial Dilutions
- Laboratory Control Samples
- Matrix Spike Recoveries
- Field Duplicates
- Identification/Quantitation
- Reporting Limits

### **Overall Evaluation of Data/Potential Usability Issues**

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

#### **Data Completeness**

The SDG was received complete and intact. Resubmissions were not required.

#### **Technical Holding Times**

According to the chain of custody records, sampling was performed on 9/9/10 and 9/10/10. Samples were received at the laboratory on 9/11/10 and 9/13/10. All sample preparation analysis was performed within holding time requirements.

## Calibration

Continuing calibration was above criteria for CCV3 (111%) and CCV4 (111%) for copper in total metals. For SEM metals, continuing calibration was below criteria for CCV5 (89.5%) and CCV6 (87.5%). Criteria for continuing calibration is 90-110%. Affected data are summarized in **Attachment 1**.

## Blanks

Various compounds were detected in the equipment blank, and method blanks for both total metals and SEM metals as indicated below. Affected data are summarized in **Attachment 1**.

Lab case narrative noted nickel and zinc results in the equipment blank were qualified as Z-01 because sample containers were contaminated with acid containing nickel and zinc.

Blank ID	Compound	Conc.	Units	Action Level	Units
LW07-EB01-091010	Copper	1.83	ug/l	0.4575	mg/kg
LW07-EB01-091010	Copper	1.55	ug/l	0.3875	mg/kg
LW07-EB01-091010	Lead	1.11	ug/l	0.2775	mg/kg
LW07-EB01-091010	Lead	1.21	ug/l	0.3025	mg/kg
LW07-EB01-091010	Nickel	64.6	ug/l	16.15	mg/kg
MB	Tin	1.4	mg/kg	7	mg/kg
MB	Tin	1.45	mg/kg	7.25	mg/kg
MB	Tin	1.41	mg/kg	7.05	mg/kg
LW07-EB01-091010	Zinc	8.61	ug/l	2.1525	mg/kg
LW07-EB01-091010	Zinc	7.58	ug/l	1.895	mg/kg
0J27402-CCB4	Zinc	5.27	ug/l	1.3175	mg/kg
MB	Lead	0.000694	umoles/g	0.00347	umoles/g
MB	Lead	0.00126	umoles/g	0.0063	umoles/g
MB	Zinc	0.00242	umoles/g	0.0121	umoles/g

## Matrix Spike/Spike Duplicate

MS/MSD recovery was below criteria for lead affecting samples LW07-SD529-00-10C and LW07-SD404-00-10C. Recoveries affecting sample LW07-SD555-00-10C were copper and lead which recovered below criteria whereas zinc recovered above criteria. Affected data are summarized in **Attachment 1**.

### **Serial Dilution**

Serial dilution did not meet criteria for nickel in sample LW07-SD555-00-10C with an RPD of 42%. Affected data are summarized in **Attachment 1**.

### **Field Duplicate Precision**

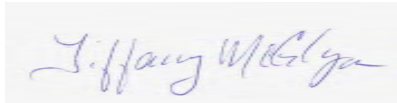
Field duplicate precision did not meet criteria for zinc in samples LW03-SD506-00-10C and LW03-SD506P-00-10C. The RPD for zinc was 57% (limit is 30% RPD). Affected data are summarized in **Attachment 1**.

## **Conclusion**

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,

A handwritten signature in blue ink, reading "Tiffany McGlynn", is displayed within a light gray rectangular box.

Tiffany McGlynn

## Qualification Flags

Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.



## Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation

Value	Description
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

## Data Validation Summary

### CTO-222 Little Creek

TO: Anita Dodson/VBO  
Megan Morrison/WDC

FROM: Tiffany McGlynn/GNV

CC: Herb Kelly/GNV

DATE: November 8, 2010

#### Introduction

The following data validation report discusses the data validation process and findings for Empirical Laboratories, LLC for SDG 1009095.

Samples were analyzed using the following analytical methods:

- SW6010B Total Metals
- SEM Metals
- SW7470A/7471 Mercury

The samples included in this SDG are listed in the table below.

Sample Name	Lab Sample ID
LW07-SD403-00-10C	1009095-01
LW07-SD403-00-10C	1009095-02
LW07-L2-SD401-00-10C	1009095-03
LW07-L2-SD401-00-10C	1009095-04
LW07-K3-SD401-00-10C	1009095-05
LW07-K3-SD401-00-10C	1009095-06
LW07-SD402-00-10C	1009095-07
LW07-SD402-00-10C	1009095-08
LW07-SD402P-00-10C	1009095-09
LW07-K4-SD401-00-10C	1009095-10
LW07-K4-SD401-00-10C	1009095-11

Sample Name	Lab Sample ID
LW07-L5-SD401-00-10C	1009095-12
LW07-L5-SD401-00-10C	1009095-13
LW07-K5-SD401-00-10C	1009095-14
LW07-K5-SD401-00-10C	1009095-15
LW07-SD401-00-10C	1009095-16
LW07-SD401-00-10C	1009095-17
LW07-J4-SD401-00-10C	1009095-18
LW07-J4-SD401-00-10C	1009095-19
LW07-H3-SD401-00-10C	1009095-20
LW07-H3-SD401-00-10C	1009095-21
LW07-F3-SD401-00-10C	1009095-22
LW07-F3-SD401-00-10C	1009095-23
LW07-D5-SD401-00-10C	1009095-24
LW07-D5-SD401-00-10C	1009095-25
LW07-B7-SD401-00-10C	1009095-26
LW07-B7-SD401-00-10C	1009095-27
LW07-F5-SD401-00-10C-01	1009095-28
LW07-B5-SD401-00-10C	1009095-30
LW07-B5-SD401-00-10C	1009095-31
LW07-B5-SD401P-00-10C	1009095-32
LW03-SD521-00-10C	1009095-33
LW03-SD521-00-10C	1009095-34
LW03-SD527-00-10C	1009095-35
LW03-SD527-00-10C	1009095-36
LW07-F5-SD401-00-10C-01	1009095-37

## Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: National Functional Guidelines for Inorganic Methods Data Review (EPA 2004) and Region III Modifications for Inorganic Data Review (EPA 1993), as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Initial/Continuing Calibrations
- Blanks

- Internal Standards
- Serial Dilutions
- Laboratory Control Samples
- Matrix Spike Recoveries
- Field Duplicates
- Identification/Quantitation
- Reporting Limits

## **Overall Evaluation of Data/Potential Usability Issues**

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

### **Data Completeness**

The SDG was received complete and intact. Resubmissions were not required.

### **Technical Holding Times**

According to the chain of custody records, sampling was performed 9/11/10 and 9/12/10. Samples were received at the laboratory on 9/14/10. All sample preparation analysis was performed within holding time requirements.

### **Field Duplicate Precision**

Field duplicate and native did not meet criteria for LW07-SD402-00-10C and LW07-SD402P-00-10C. Precision between the native and field duplicate were 46% (limit is 30%). Affected data are summarized in table below.

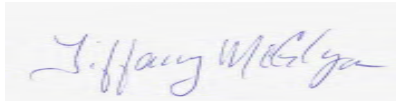
Sample ID	Compound	Q Flag	Qual Code
LW07-SD402-00-10C	Tin	J	FD
LW07-SD402P-00-10C	Tin	J	FD

## **Conclusion**

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,

A handwritten signature in blue ink, reading "Tiffany McGlynn", is displayed within a light gray rectangular box.

Tiffany McGlynn

## Qualification Flags

Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.

## Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation



Value	Description
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

CTO-222 Little Creek

Attachment 1 Change Qual. Table

SDG 1009022

Sample ID	Metals	Compound	Q Flag	Qual Code
LW03-SD504A-00-10C	6010B	Tin	B	MBL
LW03-SD504A-00-10C	6010B	Zinc	L	CCL
LW03-SD574-00-10C	6010B	Tin	B	MBL
LW03-SD574-00-10C	6010B	Zinc	L	CCL
LW03-SD504-00-10C	6010B	Tin	B	MBL
LW03-SD510-00-10C	6010B	Tin	B	MBL
LW03-SD510-00-10C	6010B	Zinc	L	CCL
LW03-SD517-00-10C	6010B	Zinc	L	CCL
LW03-SD518-00-10C	6010B	Tin	B	MBL
LW03-SD518-00-10C	6010B	Zinc	L	CCL
LW03-SD518-00-10C	SEM	Mercury	UL	MSL
LW03-SD511-00-10C	6010B	Zinc	L	CCL
LW03-SD505-00-10C	6010B	Zinc	L	CCL
LW03-SD534-00-10C	6010B	Zinc	L	CCL
LW03-SD538-00-10C	6010B	Zinc	L	CCL
LW03-SD537-00-10C	6010B	Zinc	L	CCL
LW03-SD533-00-10C	6010B	Zinc	L	CCL
LW03-SD539-00-10C	6010B	Zinc	L	CCL
LW03-SD544-00-10C	6010B	Zinc	L	CCL
LW03-SD546-00-10C	6010B	Zinc	L	CCL
LW03-SD535-00-10C	6010B	Zinc	L	CCL
LW03-SD545-00-10C	6010B	Zinc	L	CCL
LW03-SD543-00-10C	6010B	Zinc	L	CCL
LW03-SD540-00-10C	6010B	Zinc	L	CCL
LW03-SD540P-00-10C	6010B	Zinc	L	CCL

CTO-222 Little Creek

Attachment 1 Change Qual. Table

SDG 1009032

Sample ID	Metals	Compound	Q Flag	Qual Code
LW03-SD501-00-10C	6010B	Tin	B	MBL
LW03-SD501-00-10C	6010B	Zinc	L	CCL
LW03-SD501-00-10C	SEM	Nickel	B	MBL
LW03-SD501-00-10C	SEM	Zinc	L	CCL
LW03-SD502-00-10C	6010B	Tin	B	MBL
LW03-SD502-00-10C	6010B	Zinc	L	CCL
LW03-SD502-00-10C	SEM	Zinc	L	CCL
LW03-SD503-00-10C	6010B	Tin	B	MBL
LW03-SD503-00-10C	6010B	Zinc	L	CCL
LW03-SD503-00-10C	SEM	Zinc	L	CCL
LW03-SD530-00-10C	6010B	Zinc	L	CCL
LW03-SD530-00-10C	SEM	Zinc	L	CCL
LW03-SD525-00-10C	6010B	Zinc	L	CCL
LW03-SD525-00-10C	SEM	Zinc	L	CCL
LW03-SD519-00-10C	6010B	Zinc	L	CCL
LW03-SD519-00-10C	SEM	Zinc	L	CCL
LW03-SD512-00-10C	6010B	Zinc	L	CCL
LW03-SD512-00-10C	SEM	Zinc	L	CCL
LW03-SD507-00-10C	6010B	Tin	B	MBL
LW03-SD507-00-10C	6010B	Zinc	L	CCL
LW03-SD507-00-10C	SEM	Zinc	L	CCL

CTO-222 Little Creek

Attachment 1 Change Qual. Table

SDG 1009060

Sample ID	Metals	Compound	Q Flag	Qual Code
LW03-SD541-00-10C	6010B	Copper	K	CCH
LW03-SD541-00-10C	SEM	Zinc	L	CCL
LW03-SD547-00-10C	6010B	Copper	K	CCH
LW03-SD547-00-10C	SEM	Zinc	L	CCL
LW03-SD547P-00-10C	6010B	Copper	K	CCH
LW03-SD553-00-10C	6010B	Copper	K	CCH
LW03-SD559-00-10C	6010B	Copper	K	CCH
LW03-SD559-00-10C	6010B	Nickel	B	EBL
LW03-SD552-00-10C	6010B	Copper	K	CCH
LW03-SD558-00-10C	6010B	Copper	K	CCH
LW03-SD564-00-10C	6010B	Copper	K	CCH
LW03-SD551-00-10C	6010B	Copper	K	CCH
LW03-SD557-00-10C	6010B	Copper	K	CCH
LW03-SD563-00-10C	6010B	Copper	K	CCH
LW03-SD550-00-10C	6010B	Copper	K	CCH
LW03-SD550-00-10C	6010B	Nickel	B	EBL
LW03-SD556-00-10C	6010B	Copper	K	CCH
LW03-SD556P-00-10C	6010B	Copper	K	CCH
LW03-SD562-00-10C	6010B	Copper	K	CCH
LW03-SD567-00-10C	6010B	Copper	K	CCH
LW03-SD571-00-10C	6010B	Copper	K	CCH

CTO-222 Little Creek

Attachment 1 Change Qual. Table

SDG 1009086

Sample ID	Metals	Compound	Q Flag	Qual Code
LW03-SD523-00-10C	6010B	Copper	K	CCH
LW03-SD523-00-10C	SEM	Zinc	L	CCL
LW03-SD509-00-10C	6010B	Copper	K	CCH
LW03-SD509-00-10C	6010B	Nickel	B	MBL
LW03-SD509-00-10C	SEM	Zinc	L	CCL
LW03-SD529-00-10C	6010B	Tin	L	MSL
LW03-SD555-00-10C	SEM	Copper	L	MSL
LW03-SD555-00-10C	SEM	Lead	L	MSL
LW03-SD555-00-10C	SEM	Nickel	J	SD
LW03-SD555-00-10C	SEM	Zinc	K	MSH
LW03-SD506-00-10C	6010B	Zinc	J	FD
LW03-SD506P-00-10C	6010B	Zinc	J	FD
LW07-SD404-00-10C	6010B	Lead	L	MSL

## Initial and Continuing Calibration

Lab SDG/Report: 1009086

Date Analyzed 10/4/2010

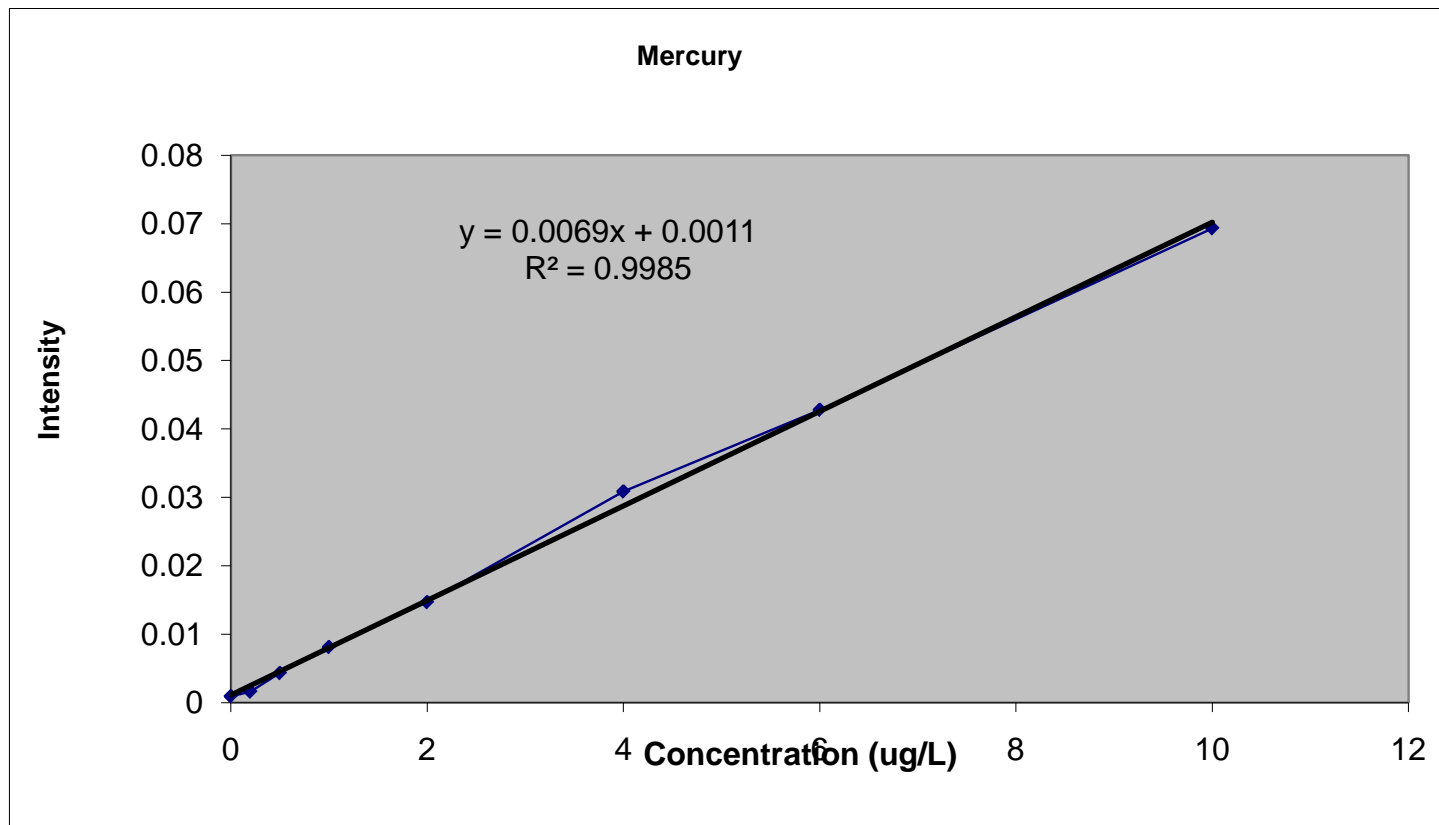
Parameter: Mercury

### Initial Calibration - $Y = mX + b$

Slope (m) = 0.0069	Lab Slope (m): 0.0069
Intercept (b) = 0.0011	Lab intercept (b): 0.001

Level	Concentration (mg/L)	Area (mVS)	RF
1	0	0.00092	0.000000E+00
2	0.2	0.00159	1.257862E+02
3	0.5	0.00431	1.160093E+02
4	1	0.00811	1.233046E+02
5	2	0.01467	1.363327E+02
6	4	0.03085	1.296596E+02
7	6	0.04279	1.402197E+02
8	10	0.06933	1.442377E+02

NR = Not Reported



### Continuing Calibration

Date / Time: 6/25/2010 - 0928

Expected Conc.	5.00	Actual Conc.	5.03
Calculated % Rec=	100.60	Lab % Rec=	101

NR - Not Reported



## Sample Concentrations

### Formula for Calculation of Concentrations

#### Soil

$$\text{Sample Conc} = \frac{(\text{Conc}_{\text{QR}}) (V_f) (\text{DF})}{(W) (S)}$$

where	ConcQR =	Concentration on Quantitation Report (ug/L)
	V <sub>f</sub> =	Final volume in liters
	DF =	Dilution factor
	W =	Weight in grams of wet sample
	S =	%solids / 100

#### Water

$$\text{Sample Conc} = (\text{Conc}_{\text{QR}}) (\text{DF})$$

where	ConcQR =	Concentration on Quantitation Report (ug/L)
	DF =	Dilution factor

<b>Sample ID</b>	1009086-36	1009086-40
<b>Date / Time Analyzed</b>	10/8/2010 - 1449	10/8/2010 - 1451
<b>Conc<sub>QR</sub></b>	0.75	3.18875
<b>V<sub>f</sub></b>	0.05	0.05
<b>DF</b>	1	1
<b>W</b>	0.35	0.33
<b>S</b>	0.3309	0.3995
<b>Calculated Conc.</b>	0.324	1.209
<b>Lab Reported Conc</b>	0.324	1.21

## Formulas

### Formula for Calculation of Recovery

$$\% \text{ Recovery} = \frac{\text{Concentration or amount found}}{\text{Concentration or amount spiked}} \times 100$$

### Formula for Calculation of Matrix Spike Recovery

$$\text{Matrix Spike Recovery} = \frac{\text{SSR} - \text{SR}}{\text{SA}} \times 100$$

where:

SSR = Spike sample result

SR = Sample result

SA = Spike added

### Formula for Calculation of Relative Percent Difference

$$\text{Relative Percent Difference (RPD)} = \frac{(| \text{Value 1} - \text{Value 2} |)}{(1/2) ( \text{Value 1} + \text{Value 2} )} \times 100$$

### Formula for Calculation of Percent Difference

$$\text{Percent Difference (\%D)} = \frac{(| \text{Value 1} - \text{Value 2} |)}{( \text{Value 1} + \text{Value 2} )} \times 100$$

## QC Check Sample

Lab SDG/Report: 1009086  
 Date Analyzed: 6/25/2010  
 Parameter: Mercury  
 Sample: 0J28402-CRL1

ug/L  
0.182

True Value  
0.2

Cal. Rec.  
91

Lab Rec.  
91

OK?  
YES

NR = Not Reported

## Laboratory Control Sample (LCS) Recoveries and/or Precision

**Lab SDG/Report:** 1009086  
**Date Analyzed:** 6/25/2010  
**Parameter:** Mercury

	<u>Conc Found</u>	<u>Conc Spiked</u>	<u>Cal. Rec.</u>	<u>Lab Rec.</u>	<u>OK?</u>
LCS Conc. Found	3.300	3.6	91.7	92	<b>YES</b>
LCSD Conc. Found					
Relative Percent Difference	=		<u>Cal. RPD</u>	<u>Lab RPD</u>	<u>OK?</u>

## MS/MSD Accuracy and Precision Recoveries

**Lab SDG/Report:** 1009086  
**Date Analyzed:** 6/25/2010  
**Parameter:** Mercury  
**Sample ID:** 1009086-42

	<u>Conc Found</u>	<u>Conc Spiked (SA)</u>	<u>Cal. Rec.</u>	<u>Lab Rec.</u>	<u>OK?</u>
Spike sample result (SSR)	0.6337	0.513	86.94	86.9	<b>YES</b>
Duplicate Spike sample result (SSR)	0.68	0.5441	90.39	90.4	<b>YES</b>
Sample result (SR)	0.1877				

**NR = Not Reported**

Relative Percent Difference	=	<u>Cal. RPD</u>	<u>Lab RPD</u>	<u>OK?</u>
		6.975	6.98	<b>YES</b>

Lab SDG/Report: 1009086  
Parameter: Zinc

## Initial and Continuing Calibration

### Initial Calibration Verification

Date / Time: 10/6/2010 1032

Expected Conc.	1000.00	Actual Conc.	986.40
Calculated % Rec=	98.64	Lab % Rec=	99%

### Continuing Calibration

Date / Time: 10/6/2010 1613

Expected Conc.	1000.00	Actual Conc.	980.00
Calculated % Rec=	98.00	Lab % Rec=	98.00

Lab SDG/Report: 1009086  
 Parameter: Zinc

## Sample Concentrations

### Formula for Calculation of Concentrations

#### Soil

$$\text{Sample Conc} = \frac{(\text{Conc}_{\text{QR}}) (V_f) (DF)] / W}{S/100}$$

where

ConcQR =

Concentration on Quantitation Report (ug/L)

$V_f$  =

Final volume in liters

DF =

Dilution factor

W =

Weight in grams of wet sample

S =

%solids

#### Water

$$\text{Sample Conc} = \frac{(\text{Conc}_{\text{QR}}) (V_f) (DF)}{(V_i)}$$

where

ConcQR =

Concentration on Quantitation Report (ug/L)

$V_f$  =

Final volume in liters

DF =

Dilution factor

$V_i$  =

Initial volume in liters

<b>Sample ID</b>	1009086-36	1009086-40
<b>Date / Time Analyzed</b>	10/6/10 1652	10/6/10 1701
<b>Parameter</b>	Zinc	Zinc
<b>Conc<sub>QR</sub></b>	3251.2	5961.6
<b><math>V_f</math></b>	0.1	0.1
<b>DF</b>	1	1
<b><math>V_i</math></b>	1	1
<b>W</b>	2.0	2.1
<b>S</b>	33.09	39.95
<b>Calculated Concentration</b>	491.3	710.6
<b>Reported Concentration</b>	491	711

Lab SDG/Report:  
Parameter:

1009086  
Copper

## Formulas

### Formula for Calculation of Recovery

$$\% \text{ Recovery} = \frac{\text{Concentration or amount found}}{\text{Concentration or amount spiked}} \times 100$$

### Formula for Calculation of Matrix Spike Recovery

$$\text{Matrix Spike Recovery} = \frac{\text{SSR} - \text{SR}}{\text{SA}} \times 100$$

where:

SSR = Spike sample result

SR = Sample result

SA = Spike added

### Formula for Calculation of Relative Percent Difference

$$\text{Relative Percent Difference (RPD)} = \frac{(| \text{Value 1} - \text{Value 2} |)}{(1/2) ( \text{Value 1} + \text{Value 2} )} \times 100$$

### Formula for Calculation of Percent Difference

$$\text{Percent Difference (\%D)} = \frac{(| \text{Value 1} - \text{Value 2} |)}{( \text{Value 1} + \text{Value 2} )} \times 100$$



## Laboratory Control Sample (LCS) Recoveries and/or Precision

<b>Sample ID</b>	0115002-BS1					
<b>Parameter</b>	Copper					
		<u>Conc Found</u>	<u>Conc Spiked</u>	<u>Cal. Rec.</u>	<u>Lab Rec.</u>	<u>OK?</u>
	LCS Conc. Found	5.24	5	105	105	<b>Yes</b>
	LCSD Conc. Found					
				<u>Cal. RPD</u>	<u>Lab RPD</u>	<u>OK?</u>
	Relative Percent Difference	=				

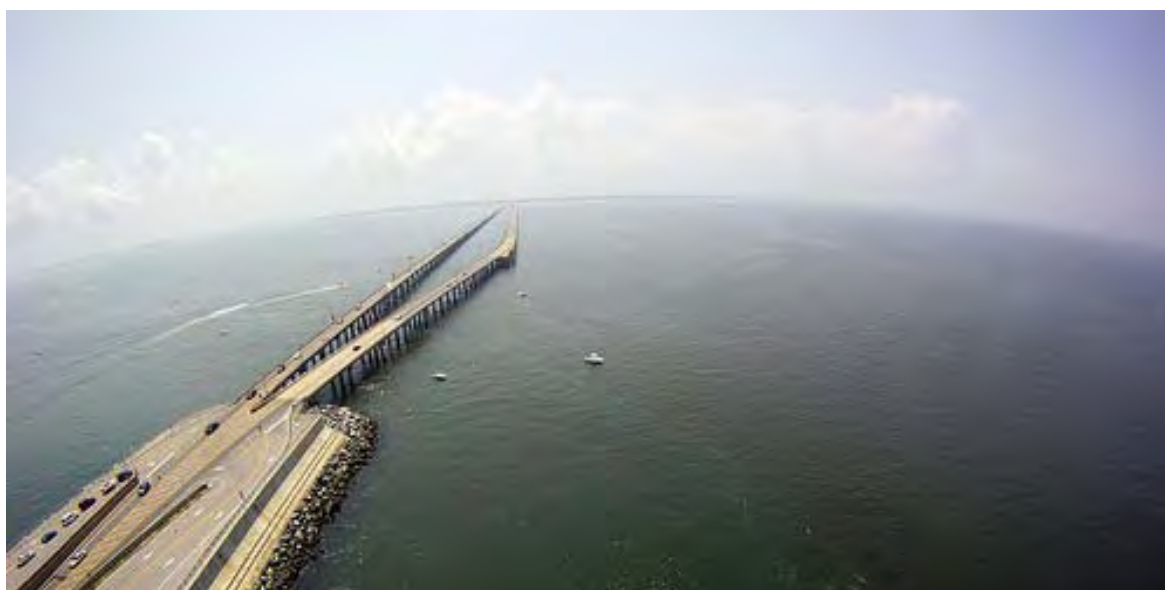
## MS/MSD Accuracy and Precision Recoveries

<b>Sample ID:</b>	1009086-42					
<b>Parameter</b>	Copper					
		<u>Conc Found</u>	<u>Conc Spiked (SA)</u>	<u>Cal. Rec.</u>	<u>Lab Rec.</u>	<u>OK?</u>
	Spike sample result (SSR)	75.96	22.11	106	106	<b>Yes</b>
	Duplicate Spike sample result (SSR)	77.1	21.9	112	112	<b>Yes</b>
	Sample result (SR)	52.56				
<b>NR = Not Reported</b>				<u>Cal. RPD</u>	<u>Lab RPD</u>	<u>OK?</u>
	Relative Percent Difference	=		1.42	1.43	<b>Yes</b>

**Attachment C**  
**Benthic Report**

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**Benthic Macroinvertebrate Infauna Data  
CLEAN III Contract Task Order 222  
SWMUs 3 and 7B  
Naval Amphibious Base Little Creek, Virginia Beach, Virginia**



Prepared for

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10-7765-01

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<b>Quality Control Procedures and Results</b>	<b>2</b>
<b>Biological Data Reduction with Computer Programs</b>	<b>3</b>
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<b>Benthic Infauna Results</b>	<b>3</b>

## **Appendices**

<b>A</b>	<b>Sorting and Identification QC Results</b>
<b>B</b>	<b>Species Density Tables</b>
<b>C</b>	<b>Raw Data Species Pollution Sensitivity Classifications and Various Metrics</b>

## Introduction

CH2M HILL is conducting work for the Atlantic Division of the Naval Facilities Engineering Command under the Navy CLEAN III contract N62470-02-D-3052, Contract Task Order 222 at Naval Amphibious Base Little Creek in Virginia Beach, Virginia. Water & Air Research, Inc. was contracted (CH2M HILL Purchase Order 940698) to analyze benthic invertebrate petite Ponar dredge samples collected by CH2M HILL staff on August 31 through September 12, 2010. Composite samples of three grabs per site at a total of 91 sites were collected within SWMUs 3 and 7B. All samples were analyzed in Water & Air's biological laboratory in Gainesville, Florida.

## Method of Analysis

Analytical methods followed for this project were described in the Quality Assurance Project Plan (Water and & Air Research 2010). In general, Water & Air adhered to Florida Department of Environmental Protection Quality Control Procedures, including LQ7410 (macroinvertebrate sorting) and LQ7420 (macroinvertebrate taxonomic identification). Also internal Florida Department of Environmental Protection Biology Department Standard Operating Procedures and Florida Administrative Code, Quality Assurance Rule, Chapter 62-160, were used as a guide for this project.

Upon receipt samples were inspected for condition and adequacy of documentation, logged and then stored in a secure air-conditioned laboratory with access restricted to authorized personnel. Preservative (formalin) was decanted through a U.S. Standard No. 35 mesh sieve (500 microns) and properly stored and disposed. Waste formalin and ethanol were double-contained and stored in a labeled locked enclosure, until transported to the Alachua County Hazardous Waste Collection Center or a certified private disposal firm.

Samples were rinsed using a U.S. Standard No. 35 mesh sieve to retain organisms, sediment, and debris. The invertebrates were sorted from the debris and placed in glass vials, preserved in 80 percent ethanol with glycerin, and sealed with stoppers. Each vial was labeled with its sample number other pertinent information, and a record of all samples was kept in an electronic Excel file. Each sample was assigned a macroinvertebrate identification log sheet. Taxonomists recorded scientific names and counts for each taxon on laboratory bench sheets. After the invertebrates were identified and counted they were placed in glass vials labeled with the sample number, preserved in 80 percent ethanol with glycerin, and sealed with stoppers.

Counts for headless organism fragments were recorded as zero (0). Fragments with a head were counted at the Lowest Practical Identification Level.

## Organism Classification

Pollution sensitivity classifications were assigned to benthic invertebrate taxa using the following published literature:

Alden, R.W., III, D.M. Dauer, J.A. Ranasinghe, L.C. Scott, and R.J. Llanos. 2002. Statistical verification of the Chesapeake Bay Benthic Index of Biotic Integrity. *Environmetrics* 13:473-498.

Llanos, R.J. 2002. Methods for calculating the Chesapeake Bay Benthic Index of Biotic Integrity. Versar, Inc., Columbia, MD.

Ranasinghe, J. A., S. B. Weisberg, D. M. Dauer, L. C. Schaffner, R. J. Diaz, and J. B. Frithsen. 1994. Chesapeake Bay Benthic Community Restoration Goals. Prepared for the U.S. EPA Chesapeake Bay Program Office, the Governor's Council on Chesapeake Bay Research Fund, and the Maryland Department of Natural Resources by Versar, Inc., Columbia, MD.

Weisberg, S.B., J.A. Ranasinghe, D.M. Dauer, L.C. Schaffner, R.J. Diaz, and J.B. Frithsen. 1997. An estuarine benthic index of biotic integrity (B-IBI) for the Chesapeake Bay. *Estuaries* 20:149-158.

Based on a review of readily available literature, numerical sensitivity scores are not available estuarine–marine macro-infauna in the project area. Based on professional judgment, Ranasinghe et al. (1994) developed a benthic infauna classification for opportunistic (OP) and equilibrium (EQ) species. Another classification for pollution-sensitive (PS) and pollution indicative (PI) estuarine macro-infauna was developed by Weisberg et al. (1997). More recent authors on the subject reference these classifications as the basis of expanded work (Alden et al. 2002; Llanos 2002).

## Quality Control Procedures and Results

Quality control (QC) checks for sample sorting were performed by a second lab technician on 13 of the 91 samples (14%) and the results were recorded in the electronic sample-processing logbook in the form of an Excel spreadsheet. Precision for macroinvertebrate data is determined for sample sorting by conducting the above-described QC check on 10 percent of the samples as described previously. For each QC check the number of specimens remaining in the sample after sorting is completed, and the total number of organisms in the sample (as counted by a taxonomist) are recorded and presented as a percentage using the following formula:

$$\frac{(\text{Total organisms} - \text{QC organisms}) \times 100}{\text{Total Organisms}} = \text{Sorting efficiency (\%)}$$

Water & Air's policy is to immediately train or re-train sorting technicians when average sorting efficiency falls below 95%. QC checks are continued on each sample until a 95% average sorting efficiency is attained. Sorting QC results are presented in Appendix A, Table A-1. Corrective actions, when necessary, are noted in the comments section of the table. Note that one of the Laboratory technicians was new and in-training at the time of this project. The two samples sorted by the new technician were checked by a second technician to ensure completeness of the sorting process.

A total of six samples were randomly selected for taxonomic QC checks from two sampling areas in the following fashion:

Three (3) samples from the SWMU 3 area

Three (3) samples from the SWMU 7B area

Taxonomic identification and count data were recorded on macroinvertebrate bench sheets. Quality control checks for identifications and counts were conducted, the results were recorded on a Taxonomy QC form, and the resulting taxonomic proficiencies were recorded in an electronic logbook. For tracking overall proficiency for each taxonomist, each entry for a given taxonomist was kept in a separate electronic file with the resulting average taxonomic proficiency. Hard copies of identifications and resolutions recorded on the Water & Air Internal Taxonomy Proficiency Form were kept in a paper file. Our policy is to immediately train or re-train when taxonomic proficiency falls below 90%. QC checks are continued until a taxonomic proficiency of at least 90% is attained by each taxonomist. QC results for taxonomic identification and counts are provided in Appendix A, Table A-2.

### **Biological Data Reduction with Computer Programs**

Due to the large number of taxa (frequently more than 50 per sample) in some samples, Water & Air uses proprietary WARSTAT and NAVSTAT computer programs to assist in data management. These programs were developed by Water & Air for use on personal computers and are currently written using Microsoft Access. Master species lists are maintained with the taxonomic name and a corresponding code name. Data output is presented in an organized tabular format and a QC check for accuracy is performed on all tabulated data.

### **Laboratory Data Management and Verification**

Calculators or computer programs are used to perform data calculations as well as WARSTAT and NAVSTAT to assist in data management. All entries or formulas used in calculations are double checked for accuracy and data output from WARSTAT and NAVSTAT is also checked.

### **Benthic Infauna Results**

Species density tables are provided in Appendix B. Raw data, species pollution sensitivity classifications, and various metrics are provided in Appendix C.



## **Appendix A**

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### Sorting and Identification QC Results

Table A-1. Results of Sorting Quality Control Checks																
Sorting Efficiency																
WAR ID #	Date Collected	Station ID	Replicate	Sample Type	Sort/Mount	Project Name	Project #	Proj. Manager	Sort Date	Sorted by	Sort QA Date	Sort QA Reviewer	Total # organisms	# found in QA	% Efficiency	Comments
20623	9/2/10	LW03 SD501	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/10/10	JF	9/23/2010	LAL	60	8	86.67%	
20647	9/1/10	LW03 SD525	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/4/10	JF	9/8/2010	TLS	0	0	100.00%	
20654	9/1/10	LW03 SD534	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/4/10	JF	9/8/2010	TLS	0	0	100.00%	
20657	9/1/10	LW03 SD538	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/4/10	JF	9/8/2010	TLS	0	0	100.00%	
20658	9/1/10	LW03 SD539	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/4/10	JF	9/8/2010	TLS	0	0	100.00%	
20681	9/8/10	LW03 SD571	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	10/1/10	JF	10/3/2010	DCC	0	0	100.00%	
20701	9/10/10	LW07 SD404-00-10C	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	10/1/10	JF	10/3/2010	DCC	104	0	100.00%	
20642	9/2/10	LW03 SD519	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/3/10	TS	9/3/2010	LAL	0	0	100.00%	
20673	9/1/10	LW03 SD556	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	10/14/10	MRP	10/15/2010	LAL	7	0	100.00%	
20683	9/12/10	LW07 B5 SD401-00-10C	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	9/28/10	MRP	9/29/2010	JF	106	1	99.00%	
20693A	9/11/10	LW07 L2 SD401-01-10C	N/A	Ponar	S	Navy Clean III	10-7765-01	DLE	10/13/10	MRP	10/14/2010	LAL	29	1	96.60%	
20676	9/7/10	LW03 SD559		Ponar	S	Navy Clean III	10-7765-01	DLE	9/27/10	ACC	9/27/2010	MRP	4	2	50.00%	In Training - Two small polychaete heads missed, training occurred
20695	9/27/10	LW07 K1 SD401-00-10C		Ponar	S	Navy Clean III	10-7765-01	DLE	9/27/10	ACC	9/29/2010	MRP	54	7	87.00%	In Training

Table A-2. Results of Identification and Count QC Checks														
Identification Efficiency														
WAR ID #	Date Collected	Station ID	Sample ID/ Replicate	Sample Type	Project Name	Project Number	Project Manager	ID Date	ID'ed by	ID QA date	ID Reviewer	Total # of Organisms	Incorrect # in QA	% ID Efficiency
20649	9/12/10	LW03SD527	1	PP	Navy Clean III	10-7765-01	DLE	10/4/2010	LL	11/11/2010	DGS	70	2	97.14%
20650	9/9/10	LW03SD528	1	PP	Navy Clean III	10-7765-01	DLE	10/4/2010	LL	11/11/2010	DGS	7	0	100.00%
20685	9/11/10	LW07D5SD401	1	PP	Navy Clean III	10-7765-01	DLE	10/6/2010	LL	11/11/2010	DGS	16	1	93.75%
20698	9/11/2010	LW07SD401	1	PP	Navy Clean III	10-7765-01	DLE	10/10/2010	LL	11/11/2010	DGS	45	2	95.55%
20703	9/1/2010	LW07SD53403	1	PP	Navy Clean III	10-7765-01	DLE	10/4/2010	LL	11/11/2010	DGS	41	0	100.00%
20713	9/11/2010	LW07SD40303	1	PP	Navy Clean III	10-7765-01	DLE	10/21/2010	LL	11/11/2010	DGS	58	1	98.27%

## **Appendix B**

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### Species Density Tables



**water & air**  
RESEARCH, INC.

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www.waterandair.com

## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD501 LW03-SD501-00-10C 09/02/10	LW03-SD502 LW03-SD502-00-10C 09/02/10	LW03-SD503 LW03-SD503-00-10C 09/02/10	LW03-SD504A LW03-SD504A-00-10C 08/31/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actinaria</b>				
<b>Family: Unspecified</b>				
Actinaria (LPIL)	-	14	-	-
Actinaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	29	-	14	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	14	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	29	14	-	14
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	14	-	-	14
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD501 LW03-SD501-00-10C 09/02/10	LW03-SD502 LW03-SD502-00-10C 09/02/10	LW03-SD503 LW03-SD503-00-10C 09/02/10	LW03-SD504A LW03-SD504A-00-10C 08/31/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	86	14	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodoceidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodoceidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	14	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	29	29	-	29
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	72	14	-
Cirratulidae (LPIL)	14	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	57	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	14	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	14
Serpulidae (LPIL)	-	14	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

<b>Taxonomic Classification</b>	<b>Station Replicate Collection Date</b>	<b>LW03-SD501 LW03-SD501-00-10C 09/02/10</b>	<b>LW03-SD502 LW03-SD502-00-10C 09/02/10</b>	<b>LW03-SD503 LW03-SD503-00-10C 09/02/10</b>	<b>LW03-SD504A LW03-SD504A-00-10C 08/31/10</b>
<i>Minuspio</i> sp.		-	-	-	-
<i>Paraprionospio pinnata</i>		-	-	-	-
<i>Polydora cornuta</i>		-	-	-	-
<i>Pseudopolydora</i> sp.		-	-	-	-
<i>Scoelelepis texana</i>		-	-	-	-
<i>Spio</i> sp.		-	-	43	-
Spionidae (LPIL)		-	-	-	-
<i>Streblospio benedicti</i>		14	-	14	29
<b>Family: Terebellidae</b>					
<i>Loimia medusa</i>		-	-	-	-
<i>Loimia</i> sp.		-	-	14	-
<i>Pista cristata</i>		-	-	-	-
Terebellidae (LPIL)		-	29	-	-
<b>Order: Capitellida</b>					
<b>Family: Capitellidae</b>					
<i>Capitella capitata</i> complex Blake		101	-	43	14
<i>Capitella jonesi</i>		-	-	-	-
<i>Capitella</i> sp.		-	14	-	-
Capitellidae (LPIL)		-	-	-	-
<i>Heteromastus filiformis</i>		-	29	-	-
<i>Mediomastus ambiseta</i>		72	-	29	57
<i>Mediomastus californiensis</i>		-	-	-	-
<i>Mediomastus</i> sp.		14	57	14	14
<b>Order: Orbiniida</b>					
<b>Family: Orbiniidae</b>					
<i>Leitoscoloplos fragilis</i>		-	-	-	-
<i>Leitoscoloplos</i> sp.		-	-	-	-
Orbiniidae (LPIL)		-	-	-	-
<i>Scoloplos rubra</i>		-	-	-	-
<b>Order: Phyllodocida</b>					
<b>Family: Pilargidae</b>					
<i>Sigambra tentaculata</i>		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Maldanidae</b>					
<i>Clymenella torquata</i>		-	-	-	-
<b>Class: Clitellata</b>					
<b>Order: Haplotaxida</b>					
<b>Family: Naididae</b>					
<i>Paranais frici</i>		-	-	-	-
<b>Family: Tubificoid Naididae</b>					
Tubificoid Naididae imm. w/o hair setae (LPIL)		-	-	-	-
<i>Tubificoides</i> sp.		-	-	-	-
<b>Phylum: Arthropoda</b>					
<b>Class: Malacostraca</b>					
<b>Order: Amphipoda</b>					
<b>Family: Aoridae</b>					
Aoridae (LPIL)		-	-	-	-





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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisi</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpho</b>				
<i>Balanomorpho</i> (LPIL)	14	29	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	14	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropho</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	14	-	-
<b>Order: Heterostropho</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astiris lunata</i>	-	-	14	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	14	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	115	72	-	-
<i>Crepidula plana</i>	29	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	14	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	14	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	14	-	-
<b>Class: Bivalvia</b>				



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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	14	-	14	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	14	29	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	29	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	86	72	29	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	14	43	43	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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Phoronida (LPIL)	101	86	43	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>	-	-	-	-
<b>Total Organisms</b>	862	761	330	187
<b>Total Taxa</b>	22	23	13	8



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<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	14	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	29	29
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	43
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	14	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	-	-	14	14
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	29	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	-	-	14	-
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	14	14
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	14
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	14	57	14
<b>Family: Cirratulidae</b>				
<i>Aphelocheata</i> sp.	-	-	-	72
Cirratulidae (LPIL)	-	-	101	-
<i>Tharyx</i> sp.	-	-	43	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	14	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	43	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD504 LW03-SD504-00-10C 08/30/10	LW03-SD505 LW03-SD505-00-10C 08/31/10	LW03-SD506 LW03-SD506-00-10C 09/10/10	LW03-SD507 LW03-SD507-00-10C 09/02/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	57	14	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	14	-	29
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	43	29	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	14	-	-	-
<i>Mediomastus ambiseta</i>	-	14	72	43
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	86	14
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-





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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD504 LW03-SD504-00-10C 08/30/10	LW03-SD505 LW03-SD505-00-10C 08/31/10	LW03-SD506 LW03-SD506-00-10C 09/10/10	LW03-SD507 LW03-SD507-00-10C 09/02/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	14	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	14
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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Sample Group: Navy Clean Aug-Sept  
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Sample Method: Petite Ponar (x3)  
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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	14	-
<i>Acteocina</i> sp.	-	-	-	14
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	14	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	14
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	57	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	244	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	14
<b>Class: Bivalvia</b>				



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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	14	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	14	57	29
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	29	-	-	29
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	14	172	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Bivalvia (LPIL)	-	-	-	43
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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2010

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Station Replicate Collection Date	LW03-SD504 LW03-SD504-00-10C 08/30/10	LW03-SD505 LW03-SD505-00-10C 08/31/10	LW03-SD506 LW03-SD506-00-10C 09/10/10	LW03-SD507 LW03-SD507-00-10C 09/02/10
Phoronida (LPIL)	-	115	374	172
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	-	-	29
<b>No Organisms Present</b>	-	-	-	-
<b>Total Organisms</b>	43	302	1537	647
<b>Total Taxa</b>	2	9	24	19



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Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD508 LW03-SD508-00-10C 09/10/10	LW03-SD509 LW03-SD509-00-10C 09/09/10	LW03-SD510 LW03-SD510-00-10C 08/31/10	LW03-SD511 LW03-SD511-00-10C 08/31/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	14	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	14
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	-	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	14	-	-	29
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	-	14	-	-
<b>Family: Nereididae</b>				



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<i>Laeonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	14	29	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	14	-	-
<b>Family: Oeononidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	14	-	14	72
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	14	14
<i>Tharyx</i> sp.	-	-	29	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	14
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	14	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	14	-	-



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<i>Minuspia</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	115	144
<i>Polydora cornuta</i>	29	-	-	29
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scoelelepis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	129	14	72	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	14	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	201	158	-	-
<i>Capitella jonesi</i>	14	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	14	-	-	-
<i>Mediomastus ambiseta</i>	-	-	29	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	14	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-





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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD508 LW03-SD508-00-10C 09/10/10	LW03-SD509 LW03-SD509-00-10C 09/09/10	LW03-SD510 LW03-SD510-00-10C 08/31/10	LW03-SD511 LW03-SD511-00-10C 08/31/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheididae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisi</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD508 LW03-SD508-00-10C 09/10/10	LW03-SD509 LW03-SD509-00-10C 09/09/10	LW03-SD510 LW03-SD510-00-10C 08/31/10	LW03-SD511 LW03-SD511-00-10C 08/31/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	57	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	101
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	14
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbelloidea</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	14	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	43	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitonidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	29
<b>Class: Bivalvia</b>				



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## Macroinvertebrate Results

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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD508 LW03-SD508-00-10C 09/10/10	LW03-SD509 LW03-SD509-00-10C 09/09/10	LW03-SD510 LW03-SD510-00-10C 08/31/10	LW03-SD511 LW03-SD511-00-10C 08/31/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	14	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	14	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	14	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	29	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	29
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	14	862	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	29	14	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	14	29	72
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	14	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD508 LW03-SD508-00-10C 09/10/10	LW03-SD509 LW03-SD509-00-10C 09/09/10	LW03-SD510 LW03-SD510-00-10C 08/31/10	LW03-SD511 LW03-SD511-00-10C 08/31/10
Phoronida (LPIL)	43	-	57	287
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	14	-	-
<b>No Organisms Present</b>	-	-	-	-
<b>Total Organisms</b>	560	1336	388	848
<b>Total Taxa</b>	13	18	10	13



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<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	29
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	14	-	-	43
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	-	-	14	14
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	14	-	-
Nereididae (LPIL)	14	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	14
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	29	14
<b>Family: Cirratulidae</b>				
<i>Aphelocheata</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	14
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	14	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	14	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	14



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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	57	-	-	29
<i>Polydora cornuta</i>	-	14	-	14
<i>Pseudopolydora</i> sp.	14	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	14	-	57	72
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	43	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	216	72	29
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	14



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclops varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheididae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				





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#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD512 LW03-SD512-00-10C 09/02/10	LW03-SD513 LW03-SD513-00-10C 09/10/10	LW03-SD514 LW03-SD514-00-10C 09/10/10	LW03-SD515 LW03-SD515-00-10C 09/09/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
Balanomorpha (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
Collembola (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Crustacea (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Gastropoda (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD512 LW03-SD512-00-10C 09/02/10	LW03-SD513 LW03-SD513-00-10C 09/10/10	LW03-SD514 LW03-SD514-00-10C 09/10/10	LW03-SD515 LW03-SD515-00-10C 09/09/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	14
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD512 LW03-SD512-00-10C 09/02/10	LW03-SD513 LW03-SD513-00-10C 09/10/10	LW03-SD514 LW03-SD514-00-10C 09/10/10	LW03-SD515 LW03-SD515-00-10C 09/09/10
Phoronida (LPIL)	-	14	-	57
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>				
<b>Total Organisms</b>	129	302	187	374
<b>Total Taxa</b>	6	5	5	14



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<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	14	14	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	-	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	72	-	-	-
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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2010

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**Report Date:** 11/08/2010

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Station Replicate Collection Date	LW03-SD516 LW03-SD516-00-10C 09/09/10	LW03-SD517 LW03-SD517-00-10C 08/31/10	LW03-SD518 LW03-SD518-00-10C 08/31/10	LW03-SD519 LW03-SD519-00-10C 09/02/10
<i>Laeonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	14	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	14
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	29
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	-	43
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	29
<i>Scolecopsis texana</i>	14	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	14	-	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	29	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	14	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	14	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	14	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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Station Replicate Collection Date	LW03-SD516 LW03-SD516-00-10C 09/09/10	LW03-SD517 LW03-SD517-00-10C 08/31/10	LW03-SD518 LW03-SD518-00-10C 08/31/10	LW03-SD519 LW03-SD519-00-10C 09/02/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisi</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	14	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	29	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpho</b>				
<i>Balanomorpho</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	14	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astiris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	14	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				





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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	14	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	244	14	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	29	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL

**Project:** Navy Clean III

**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)

**Report Date:** 11/08/2010

### Taxonomic Classification

	Station Replicate Collection Date	LW03-SD516 LW03-SD516-00-10C 09/09/10	LW03-SD517 LW03-SD517-00-10C 08/31/10	LW03-SD518 LW03-SD518-00-10C 08/31/10	LW03-SD519 LW03-SD519-00-10C 09/02/10
Phoronida (LPIL)		57	-	-	-
<b>Phylum: Echinodermata</b>					
<b>Class: Ophiuroidea</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Ophiuroidea (LPIL)		-	-	-	-
<b>Phylum: Chordata</b>					
<b>Class: Cephalochordata</b>					
<b>Order: Amphioxiformes</b>					
<b>Family: Branchiostomatidae</b>					
Branchiostoma sp.		-	-	-	-
<b>No Organisms Present</b>		-	-	-	-
<b>Total Organisms</b>		560	29	57	115
<b>Total Taxa</b>		14	2	3	4



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	14	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomerings) rudolphi</i>	-	14	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	43	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	14	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	-	-	43	57
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	57	-	-	14
Hesionidae (LPIL)	57	14	-	-
<i>Podarke obscura</i>	187	-	-	29
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
<i>Laonereis culveri</i>	-	-	-	29
<i>Neanthes succinea</i>	14	14	-	14
Nereididae (LPIL)	-	-	-	101
<i>Platynereis dumerilii</i>	-	-	-	14
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	43	29	14	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	14
Cirratulidae (LPIL)	-	14	14	29
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	14	29
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	14	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	29	-	14
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	43
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	29	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	29	29	29
<i>Polydora cornuta</i>	57	29	-	29
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scoelepis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	14	-	-	14
<i>Streblospio benedicti</i>	201	57	201	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	72	29	-	-
Terebellidae (LPIL)	-	-	29	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	101	216	14	675
<i>Capitella jonesi</i>	29	14	29	43
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	14
<i>Mediomastus ambiseta</i>	101	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	43	-	14	72
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	14	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	14
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	359	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	14



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Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	29	-	-	-
<i>Monocorophium insidiosum</i>	14	-	-	-
<i>Monocorophium</i> sp.	187	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	14	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	14
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	14	-	-	14
<i>Panopeus herbstii</i>	-	-	-	14
<i>Rhithropanopeus harrisii</i>	-	-	-	29
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	14
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	43
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	14	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	14	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	57
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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## Macroinvertebrate Results

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Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	14
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	14
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	43
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	29	216
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	14	14	57
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	14	29	29
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				





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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
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#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD520 LW03-SD520-00-10C 09/10/10	LW03-SD521 LW03-SD521-00-10C 09/12/10	LW03-SD522 LW03-SD522-00-10C 09/09/10	LW03-SD523 LW03-SD523-00-10C 09/09/10
Phoronida (LPIL)	-	-	244	129
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	-	-	-
No Organisms Present	-	-	-	-
<b>Total Organisms</b>	1652	575	761	1983
<b>Total Taxa</b>	20	18	17	35



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Sample Method: Petite Ponar (x3)

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Station Replicate Collection Date	LW03-SD525 LW03-SD525-00-10C 09/02/10	LW03-SD526 LW03-SD526-00-10C 09/10/10	LW03-SD527 LW03-SD527-00-10C 09/12/10	LW03-SD528 LW03-SD528-00-10C 09/09/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	14	14	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	532	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	14	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	14
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	14	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	-	-	-	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	-	-	43	-
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD525 LW03-SD525-00-10C 09/02/10	LW03-SD526 LW03-SD526-00-10C 09/10/10	LW03-SD527 LW03-SD527-00-10C 09/12/10	LW03-SD528 LW03-SD528-00-10C 09/09/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	14	29
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	115	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	29	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	29	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	-	43
<i>Polydora cornuta</i>	-	-	57	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	43	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	129	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheididae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisi</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorph</b>				
<i>Balanomorph</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	14	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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**Prepared For:** CH2M HILL  
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Station Replicate Collection Date	LW03-SD525 LW03-SD525-00-10C 09/02/10	LW03-SD526 LW03-SD526-00-10C 09/10/10	LW03-SD527 LW03-SD527-00-10C 09/12/10	LW03-SD528 LW03-SD528-00-10C 09/09/10
Phoronida (LPIL)	-	-	-	14
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>	✓	-	-	-
<b>Total Organisms</b>	0	57	1006	101
<b>Total Taxa</b>	N/A	2	12	4





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<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	14	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	101	-	-	-
Actiniaria sp. A	14	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomerings</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	-	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	43	-	-	-
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	72	-	-	-
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	57	-	-	-
<i>Tharyx</i> sp.	57	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	43	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	29	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD529 LW03-SD529-00-10C 09/09/10	LW03-SD530 LW03-SD530-00-10C 09/02/10	LW03-SD533 LW03-SD533-00-10C 09/01/10	LW03-SD534-01 LW03-SD534-01-10C 09/01/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	43	-
<i>Polydora cornuta</i>	129	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	43	-	57	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	43	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	29	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	29	-	-	-
<i>Heteromastus filiformis</i>	14	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	129	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	14	-	-	-
<i>Scoloplos rubra</i>	29	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	14	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclops varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	14	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	29	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	72	-	-	-
<i>Crepidula plana</i>	29	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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2010

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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	14	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	115	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	445	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	43	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	517	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	72	-	14	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

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**Sample Group:** Navy Clean Aug-Sept  
2010

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Station Replicate Collection Date	LW03-SD529 LW03-SD529-00-10C 09/09/10	LW03-SD530 LW03-SD530-00-10C 09/02/10	LW03-SD533 LW03-SD533-00-10C 09/01/10	LW03-SD534-01 LW03-SD534-01-10C 09/01/10
Phoronida (LPIL)	158	-	29	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	-	-	-
<b>No Organisms Present</b>	-	✓	-	✓
<b>Total Organisms</b>	2414	14	144	14
<b>Total Taxa</b>	30	N/A	4	N/A



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2010

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Station Replicate Collection Date	LW03-SD535 LW03-SD535-00-10C 09/01/10	LW03-SD537 LW03-SD537-00-10C 09/01/10	LW03-SD538 LW03-SD538-00-10C 09/01/10	LW03-SD539 LW03-SD539-00-10C 09/01/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	14	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	29	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	14	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	273	-	-	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	115	-	-	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	144	-	-	-
<b>Family: Nereididae</b>				





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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodoceidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	14	-	-	-
Phyllodoceidae (LPIL)	14	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	14	-	-	-
<i>Tharyx</i> sp.	14	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	72	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	72	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	14	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspia</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	-	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	14	14	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	57	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	14	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	14	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	43	-	-	-
<i>Mediomastus californiensis</i>	14	-	-	-
<i>Mediomastus</i> sp.	57	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	14	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD535 LW03-SD535-00-10C 09/01/10	LW03-SD537 LW03-SD537-00-10C 09/01/10	LW03-SD538 LW03-SD538-00-10C 09/01/10	LW03-SD539 LW03-SD539-00-10C 09/01/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheididae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisi</i>	14	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD535 LW03-SD535-00-10C 09/01/10	LW03-SD537 LW03-SD537-00-10C 09/01/10	LW03-SD538 LW03-SD538-00-10C 09/01/10	LW03-SD539 LW03-SD539-00-10C 09/01/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	14	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	57	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD535 LW03-SD535-00-10C 09/01/10	LW03-SD537 LW03-SD537-00-10C 09/01/10	LW03-SD538 LW03-SD538-00-10C 09/01/10	LW03-SD539 LW03-SD539-00-10C 09/01/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	14	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	43	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	14	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	43	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	29	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	172	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD535 LW03-SD535-00-10C 09/01/10	LW03-SD537 LW03-SD537-00-10C 09/01/10	LW03-SD538 LW03-SD538-00-10C 09/01/10	LW03-SD539 LW03-SD539-00-10C 09/01/10
Phoronida (LPIL)	158	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>	-	-	✓	✓
<b>Total Organisms</b>	1595	14	14	14
<b>Total Taxa</b>	31	1	N/A	N/A



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2010

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Station Replicate Collection Date	LW03-SD540 LW03-SD540-00-10C 09/01/10	LW03-SD541 LW03-SD541-00-10C 09/07/10	LW03-SD543 LW03-SD543-00-10C 09/01/10	LW03-SD544 LW03-SD544-00-10C 09/01/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	-	-	-	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

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Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
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### Taxonomic Classification

Station Replicate Collection Date	LW03-SD540 LW03-SD540-00-10C 09/01/10	LW03-SD541 LW03-SD541-00-10C 09/07/10	LW03-SD543 LW03-SD543-00-10C 09/01/10	LW03-SD544 LW03-SD544-00-10C 09/01/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	29	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	14	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-





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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	14	-	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scoelelepis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	-	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD540 LW03-SD540-00-10C 09/01/10	LW03-SD541 LW03-SD541-00-10C 09/07/10	LW03-SD543 LW03-SD543-00-10C 09/01/10	LW03-SD544 LW03-SD544-00-10C 09/01/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	14	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD540 LW03-SD540-00-10C 09/01/10	LW03-SD541 LW03-SD541-00-10C 09/07/10	LW03-SD543 LW03-SD543-00-10C 09/01/10	LW03-SD544 LW03-SD544-00-10C 09/01/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	14	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	14	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD540 LW03-SD540-00-10C 09/01/10	LW03-SD541 LW03-SD541-00-10C 09/07/10	LW03-SD543 LW03-SD543-00-10C 09/01/10	LW03-SD544 LW03-SD544-00-10C 09/01/10
Phoronida (LPIL)	-	29	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>	✓	-	✓	✓
<b>Total Organisms</b>	14	129	14	14
<b>Total Taxa</b>	N/A	7	N/A	N/A



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<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	14
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	-	-	29	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodoceidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodoceidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	14	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apopriospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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### Taxonomic Classification

Station Replicate Collection Date	LW03-SD545 LW03-SD545-00-10C 09/01/10	LW03-SD546 LW03-SD546-00-10C 09/01/10	LW03-SD547 LW03-SD547-00-10C 09/07/10	LW03-SD548 LW03-SD548-00-10C 09/09/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	-	-
<i>Polydora cornuta</i>	-	-	14	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	-	14	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-





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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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Sample Method: Petite Ponar (x3)  
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#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD545 LW03-SD545-00-10C 09/01/10	LW03-SD546 LW03-SD546-00-10C 09/01/10	LW03-SD547 LW03-SD547-00-10C 09/07/10	LW03-SD548 LW03-SD548-00-10C 09/09/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	29	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	187	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD545 LW03-SD545-00-10C 09/01/10	LW03-SD546 LW03-SD546-00-10C 09/01/10	LW03-SD547 LW03-SD547-00-10C 09/07/10	LW03-SD548 LW03-SD548-00-10C 09/09/10
Phoronida (LPIL)	-	-	-	-
Phylum: Echinodermata				
Class: Ophiuroidea				
Order: Unspecified				
Family: Unspecified				
Ophiuroidea (LPIL)	-	-	-	-
Phylum: Chordata				
Class: Cephalochordata				
Order: Amphioxiformes				
Family: Branchiostomatidae				
Branchiostoma sp.	-	-	-	-
No Organisms Present	✓	✓	-	-
Total Organisms	14	14	287	14
Total Taxa	N/A	N/A	6	1



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#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD549 LW03-SD549-00-10C 09/09/10	LW03-SD550-01 LW03-SD550-01-10C 09/08/10	LW03-SD551 LW03-SD551-00-10C 09/08/10	LW03-SD552 LW03-SD552-00-10C 09/07/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	-	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	-	-	-	-
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD549 LW03-SD549-00-10C 09/09/10	LW03-SD550-01 LW03-SD550-01-10C 09/08/10	LW03-SD551 LW03-SD551-00-10C 09/08/10	LW03-SD552 LW03-SD552-00-10C 09/07/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelocheata</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	14	-
<i>Polydora cornuta</i>	-	-	14	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	-	14	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	29	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				





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Prepared For: CH2M HILL  
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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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Phoronida (LPIL)	-	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	-	-	-
<b>No Organisms Present</b>	-	✓	-	✓
<b>Total Organisms</b>	29	14	43	14
<b>Total Taxa</b>	1	N/A	3	N/A



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD553 LW03-SD553-00-10C 09/07/10	LW03-SD555 LW03-SD555-00-10C 09/09/10	LW03-SD556 LW03-SD556-00-10C 09/08/10	LW03-SD557 LW03-SD557-00-10C 09/08/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	14	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	14	-	-	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	-	-
Hesionidae (LPIL)	14	-	-	-
<i>Podarke obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD553 LW03-SD553-00-10C 09/07/10	LW03-SD555 LW03-SD555-00-10C 09/09/10	LW03-SD556 LW03-SD556-00-10C 09/08/10	LW03-SD557 LW03-SD557-00-10C 09/08/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodoceidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodoceidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	14	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apopriospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	14	14	-	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	172	43	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	14	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	14	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	14	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	14	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	14
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	29	14
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	14	-
<i>Neomysis americana</i>	-	-	-	14
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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<i>Squilla empusa</i>	-	-	14	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	14	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	14	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyrus lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	14	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				





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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	14	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	29	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	14	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	14	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	57	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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Phoronida (LPIL)	14	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	-	-	-
<b>No Organisms Present</b>	-	-	-	-
<b>Total Organisms</b>	316	187	101	43
<b>Total Taxa</b>	18	2	4	3



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<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	14	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	-	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	-	-	-	-
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	14	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelocheata</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD558-01 LW03-SD558-01-10C 09/08/10	LW03-SD559 LW03-SD559-00-10C 09/07/10	LW03-SD562 LW03-SD562-00-10C 09/08/10	LW03-SD563 LW03-SD563-00-10C 09/08/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	14	-	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	14	14	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisi</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	14	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	14	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	14	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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Prepared For: CH2M HILL  
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Sample Method: Petite Ponar (x3)  
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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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**Project:** Navy Clean III

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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				





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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
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#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD558-01 LW03-SD558-01-10C 09/08/10	LW03-SD559 LW03-SD559-00-10C 09/07/10	LW03-SD562 LW03-SD562-00-10C 09/08/10	LW03-SD563 LW03-SD563-00-10C 09/08/10
Phoronida (LPIL)	-	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma</i> sp.	-	-	-	-
No Organisms Present	-	-	-	✓
<b>Total Organisms</b>	43	57	14	14
<b>Total Taxa</b>	3	4	1	NA



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Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

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Station Replicate Collection Date	LW03-SD564 LW03-SD564-00-10C 09/08/10	LW03-SD567 LW03-SD567-00-10C 09/08/10	LW03-SD571 LW03-SD571-00-10C 09/08/10	LW03-SD574 LW03-SD574-00-10C 08/31/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	-	-	-	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	-	-	-	-
Hesionidae (LPIL)	-	-	-	-
<i>Podarke obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodoceidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodoceidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apopriospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	-	-	-	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scoelepis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	-	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capiteiida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD564 LW03-SD564-00-10C 09/08/10	LW03-SD567 LW03-SD567-00-10C 09/08/10	LW03-SD571 LW03-SD571-00-10C 09/08/10	LW03-SD574 LW03-SD574-00-10C 08/31/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheididae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	14	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	14	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

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<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
Balanomorpha (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
Collembola (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Crustacea (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Gastropoda (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

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Station Replicate Collection Date	LW03-SD564 LW03-SD564-00-10C 09/08/10	LW03-SD567 LW03-SD567-00-10C 09/08/10	LW03-SD571 LW03-SD571-00-10C 09/08/10	LW03-SD574 LW03-SD574-00-10C 08/31/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Bivalvia (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD564 LW03-SD564-00-10C 09/08/10	LW03-SD567 LW03-SD567-00-10C 09/08/10	LW03-SD571 LW03-SD571-00-10C 09/08/10	LW03-SD574 LW03-SD574-00-10C 08/31/10
Phoronida (LPIL)	-	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>	-	✓	✓	✓
<b>Total Organisms</b>	29	14	14	14
<b>Total Taxa</b>	2	N/A	N/A	N/A





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Report Date: 11/08/2010

Taxonomic Classification	Station Replicate Collection Date	LW07-B5-SD401 LW07-B5- SD401-00-10C 09/12/10	LW07-B7-SD401 LW07-B7- SD401-00-10C 09/12/10	LW07-D5-SD401 LW07-D5- SD401-00-10C 09/11/10	LW07-F3-SD401 LW07-F3- SD401-00-10C 09/11/10
<b>Phylum: Porifera</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Porifera (LPIL)		-	-	14	-
<b>Phylum: Cnidaria</b>					
<b>Class: Hydrozoa</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Hydrozoa (LPIL)		-	-	-	-
<b>Class: Anthozoa</b>					
<b>Order: Actiniaria</b>					
<b>Family: Unspecified</b>					
Actiniaria (LPIL)		-	14	-	-
Actiniaria sp. A		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Anthozoa (LPIL)		-	57	-	-
<b>Phylum: Nemertea</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Nemertea (LPIL)		14	14	-	14
Nemertea sp. A (LPIL)		29	-	14	-
Nemertea sp. B (LPIL)		14	-	-	29
Nemertea sp. C (LPIL)		-	-	-	-
Nemertea sp. D (LPIL)		-	-	-	14
<b>Phylum: Annelida</b>					
<b>Class: Polychaeta</b>					
<b>Order: Aciculata</b>					
<b>Family: Dorvilleidae</b>					
<i>Dorvillea (Schistomeringos) rudolphi</i>		-	216	-	-
Dorvilleidae (LPIL)		-	29	-	-
<b>Family: Eunicidae</b>					
<i>Marphysa sanguinea</i>		-	-	-	-
<b>Family: Glyceridae</b>					
<i>Glycera americana</i>		-	14	-	14
<i>Glycera dibranchiata</i>		-	-	-	-
<i>Glycera</i> sp.		-	14	-	-
<i>Ophioglycera</i> sp.		-	-	-	-
<b>Family: Goniadidae</b>					
<i>Glycinde solitaria</i>		43	43	14	14
<b>Family: Hesionidae</b>					
<i>Gyptis crypta</i>		-	43	-	14
Hesionidae (LPIL)		-	-	-	-
<i>Podarke obscura</i>		-	417	-	-
<b>Family: Nereididae</b>					



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Station Replicate Collection Date	LW07-B5-SD401 LW07-B5- SD401-00-10C 09/12/10	LW07-B7-SD401 LW07-B7- SD401-00-10C 09/12/10	LW07-D5-SD401 LW07-D5- SD401-00-10C 09/11/10	LW07-F3-SD401 LW07-F3- SD401-00-10C 09/11/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	29	-	-
Nereididae (LPIL)	-	29	-	-
<i>Platynereis dumerillii</i>	-	129	-	14
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	14	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	14	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	57	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	14	29	-	14
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	101	57	-	129
<i>Tharyx</i> sp.	43	29	43	129
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	29	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	43	-	-
<i>Sabellaria vulgaris</i>	-	14	-	-
Sabellidae (LPIL)	-	29	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	517	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	144	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	14	-	-
<i>Dipolydora socialis</i>	-	14	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspio</i> sp.		-	14	-	-
<i>Paraprionospio pinnata</i>		201	158	86	57
<i>Polydora cornuta</i>		29	-	-	-
<i>Pseudopolydora</i> sp.		-	-	-	-
<i>Scolecopsis texana</i>		-	-	-	-
<i>Spio</i> sp.		-	-	-	-
Spionidae (LPIL)		-	-	-	-
<i>Streblospio benedicti</i>		-	14	-	72
<b>Family: Terebellidae</b>					
<i>Loimia medusa</i>		43	14	-	43
<i>Loimia</i> sp.		14	-	-	-
<i>Pista cristata</i>		-	-	-	-
Terebellidae (LPIL)		-	14	-	-
<b>Order: Capitellida</b>					
<b>Family: Capitellidae</b>					
<i>Capitella capitata</i> complex Blake		-	-	-	-
<i>Capitella jonesi</i>		-	14	-	-
<i>Capitella</i> sp.		-	-	-	-
Capitellidae (LPIL)		-	-	-	-
<i>Heteromastus filiformis</i>		14	-	-	-
<i>Mediomastus ambiseta</i>		-	259	-	29
<i>Mediomastus californiensis</i>		-	158	-	-
<i>Mediomastus</i> sp.		14	675	14	-
<b>Order: Orbiniida</b>					
<b>Family: Orbiniidae</b>					
<i>Leitoscoloplos fragilis</i>		14	14	-	-
<i>Leitoscoloplos</i> sp.		-	-	-	-
Orbiniidae (LPIL)		-	-	-	-
<i>Scoloplos rubra</i>		-	-	-	-
<b>Order: Phyllodocida</b>					
<b>Family: Pilargidae</b>					
<i>Sigambra tentaculata</i>		29	14	14	-
<b>Order: Unspecified</b>					
<b>Family: Maldanidae</b>					
<i>Clymenella torquata</i>		-	-	-	-
<b>Class: Clitellata</b>					
<b>Order: Haplotaxida</b>					
<b>Family: Naididae</b>					
<i>Paranais frici</i>		-	-	-	-
<b>Family: Tubificoid Naididae</b>					
Tubificoid Naididae imm. w/o hair setae (LPIL)		-	86	-	14
<i>Tubificoides</i> sp.		-	86	-	-
<b>Phylum: Arthropoda</b>					
<b>Class: Malacostraca</b>					
<b>Order: Amphipoda</b>					
<b>Family: Aoridae</b>					
Aoridae (LPIL)		-	-	-	-



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<b>Family: Corophiidae</b>					
<i>Monocorophium acherusicum</i>		-	-	-	-
<i>Monocorophium insidiosum</i>		-	-	-	-
<i>Monocorophium</i> sp.		-	-	-	-
<b>Family: Liljeborgiidae</b>					
<i>Listriella clymenellae</i>		-	-	-	-
<b>Order: Cumacea</b>					
<b>Family: Bodotriidae</b>					
<i>Cyclaspis varians</i>		-	-	-	-
<b>Family: Leuconidae</b>					
<i>Leucon americanus</i>		-	-	-	14
<b>Family: Unspecified</b>					
Cumacea (LPIL)		-	-	-	-
<b>Order: Decapoda</b>					
<b>Family: Alpheidae</b>					
<i>Alpheus</i> sp.		-	-	-	-
<b>Family: Palaemonidae</b>					
<i>Palaemonetes</i> sp.		-	-	-	-
<b>Family: Panopeidae</b>					
Panopeidae (LPIL)		-	29	-	-
<i>Panopeus herbstii</i>		-	-	-	-
<i>Rhithropanopeus harrisii</i>		-	-	-	-
<b>Family: Pinnotheridae</b>					
<i>Pinnixa</i> sp.		-	-	-	-
<b>Family: Portunidae</b>					
<i>Callinectes</i> sp.		-	-	-	-
Portunidae (LPIL)		-	-	-	-
<b>Family: Unspecified</b>					
Decapoda (LPIL)		-	-	-	-
Decapoda (zoea)		-	-	-	-
Decapoda zoea (larva)		-	-	-	-
<b>Order: Isopoda</b>					
<b>Family: Idoteidae</b>					
<i>Edotia triloba</i>		-	-	-	-
<b>Order: Leptostraca</b>					
<b>Family: Unspecified</b>					
Leptostraca (LPIL)		-	-	-	-
<b>Order: Mysida</b>					
<b>Family: Mysidae</b>					
<i>Americamysis bigelowi</i>		-	-	-	-
<i>Americamysis</i> sp.		-	-	-	-
Mysidae (LPIL)		-	-	-	-
<i>Neomysis americana</i>		-	-	-	-
<b>Family: Unspecified</b>					
Mysidacea (LPIL)		-	-	-	-
<b>Order: Stomatopoda</b>					
<b>Family: Squillidae</b>					



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## Macroinvertebrate Results

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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

<b>Taxonomic Classification</b>	<b>Station Replicate Collection Date</b>	<b>LW07-B5-SD401 LW07-B5- SD401-00-10C 09/12/10</b>	<b>LW07-B7-SD401 LW07-B7- SD401-00-10C 09/12/10</b>	<b>LW07-D5-SD401 LW07-D5- SD401-00-10C 09/11/10</b>	<b>LW07-F3-SD401 LW07-F3- SD401-00-10C 09/11/10</b>
<i>Squilla empusa</i>		-	-	-	-
<b>Class: Maxillopoda</b>					
<b>Order: Sessilia</b>					
<b>Family: Balanoidea</b>					
<i>Balanus improvisus</i>		-	-	-	-
<b>Family: Balanomorpha</b>					
<i>Balanomorpha</i> (LPIL)		-	-	-	-
<b>Class: Entognatha</b>					
<b>Order: Collembola</b>					
<b>Family: Unspecified</b>					
<i>Collembola</i> (LPIL)		-	-	14	-
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
<i>Crustacea</i> (LPIL)		-	-	-	-
<b>Phylum: Mollusca</b>					
<b>Class: Gastropoda</b>					
<b>Order: Cephalaspidea</b>					
<b>Family: Cylichnidae</b>					
<i>Acteocina canaliculata</i>		302	101	-	287
<i>Acteocina</i> sp.		-	-	-	-
<b>Order: Heterostrophia</b>					
<b>Family: Pyramidellidae</b>					
<i>Odostomia engonia</i>		14	-	14	-
<b>Order: Heterostrophia</b>					
<b>Family: Pyramidellidae</b>					
<i>Turbonilla interrupta</i>		-	-	-	-
<b>Order: Neogastropoda</b>					
<b>Family: Columbellidae</b>					
<i>Astyris lunata</i>		-	-	-	-
<i>Nassarius vibex</i>		-	-	-	-
<b>Family: Conidae</b>					
<i>Pyrgocythara plicosa</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Calyptraeidae</b>					
<i>Crepidula fornicata</i>		43	259	-	-
<i>Crepidula plana</i>		14	14	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Cerithiopsidae</b>					
<i>Cerithiopsis greenii</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Epitoniidae</b>					
<i>Epitonium rupicola</i>		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
<i>Gastropoda</i> (LPIL)		29	29	-	-
<b>Class: Bivalvia</b>					



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**Sample Group:** Navy Clean Aug-Sept  
2010

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<b>Order: Arcoida</b>					
<b>Family: Arcidae</b>					
<i>Anadara transversa</i>		-	43	-	-
<b>Order: Mytiloida</b>					
<b>Family: Mytilidae</b>					
<i>Amygdalum papyrium</i>		-	-	-	-
<b>Order: Ostreoida</b>					
<b>Family: Anomiidae</b>					
<i>Anomia simplex</i>		-	201	-	-
<b>Order: Ostreoida</b>					
<b>Family: Anomiidae</b>					
<i>Pododesmus rudis</i>		-	-	-	-
<b>Order: Ostreoida</b>					
<b>Family: Ostreidae</b>					
<i>Crassostrea virginica</i>		-	-	-	-
<b>Order: Pholadomyoida</b>					
<b>Family: Lyonsiidae</b>					
<i>Lyonsia hyalina</i>		14	-	-	-
<b>Order: Veneroida</b>					
<b>Family: Mactridae</b>					
Mactridae (LPIL)		-	-	-	43
<i>Mulinia lateralis</i>		-	-	-	-
<i>Mulinia lateralis</i>		-	-	-	-
<b>Family: Petricolidae</b>					
<i>Petricolaria pholadiformis</i>		14	-	-	-
<b>Family: Solecurtidae</b>					
<i>Tagelus plebeius</i>		-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-
<b>Family: Tellinidae</b>					
<i>Macoma tenta</i>		-	-	-	-
Tellinidae (LPIL)		-	-	-	-
<b>Family: Veneridae</b>					
<i>Gemma gemma</i>		-	-	-	14
<b>Order: Veneroida</b>					
<b>Family: Veneridae</b>					
<i>Mercenaria mercenaria</i>		-	-	-	-
<b>Order: Veneroida</b>					
<b>Family: Veneridae</b>					
<i>Pitar</i> sp.		-	-	-	-
Veneridae (LPIL)		72	172	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
<i>Bivalvia</i> (LPIL)		43	14	-	-
<b>Phylum: Phoronida</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					



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Phoronida (LPIL)		359	115	-	72
<b>Phylum: Echinodermata</b>					
<b>Class: Ophiuroidea</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Ophiuroidea (LPIL)		-	-	-	-
<b>Phylum: Chordata</b>					
<b>Class: Cephalochordata</b>					
<b>Order: Amphioxiformes</b>					
<b>Family: Branchiostomatidae</b>					
Branchiostoma sp.		-	-	-	-
<b>No Organisms Present</b>		-	-	-	-
<b>Total Organisms</b>		1523	4555	230	1034
<b>Total Taxa</b>		25	50	9	20



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<b>Phylum: Porifera</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Porifera (LPIL)		-	-	-	-
<b>Phylum: Cnidaria</b>					
<b>Class: Hydrozoa</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Hydrozoa (LPIL)		-	-	-	-
<b>Class: Anthozoa</b>					
<b>Order: Actiniaria</b>					
<b>Family: Unspecified</b>					
Actiniaria (LPIL)		-	-	-	-
Actiniaria sp. A		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Anthozoa (LPIL)		-	-	-	-
<b>Phylum: Nemertea</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Nemertea (LPIL)		72	-	-	14
Nemertea sp. A (LPIL)		-	-	-	-
Nemertea sp. B (LPIL)		-	-	-	-
Nemertea sp. C (LPIL)		14	-	-	-
Nemertea sp. D (LPIL)		-	-	-	-
<b>Phylum: Annelida</b>					
<b>Class: Polychaeta</b>					
<b>Order: Aciculata</b>					
<b>Family: Dorvilleidae</b>					
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>		14	-	-	-
Dorvilleidae (LPIL)		-	-	-	-
<b>Family: Eunicidae</b>					
Marphysa <i>sanguinea</i>		-	-	-	-
<b>Family: Glyceridae</b>					
Glycera <i>americana</i>		-	-	-	-
Glycera <i>dibranchiata</i>		-	-	-	-
Glycera sp.		-	-	-	-
Ophioglycera sp.		-	-	-	-
<b>Family: Goniadidae</b>					
Glycinde <i>solitaria</i>		43	29	14	14
<b>Family: Hesionidae</b>					
Gyptis <i>crypta</i>		-	-	-	-
Hesionidae (LPIL)		-	-	-	-
Podarke <i>obscura</i>		29	-	29	-
<b>Family: Nereididae</b>					





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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	43	-	-	-
Nereididae (LPIL)	14	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodoceidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodoceidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelocheata</i> sp.	14	-	-	-
Cirratulidae (LPIL)	115	57	-	402
<i>Tharyx</i> sp.	57	-	29	72
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	14	14	14	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	14	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	14	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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<i>Minuspis sp.</i>		-	-	-	-
<i>Paraprionospio pinnata</i>		-	101	259	86
<i>Polydora cornuta</i>		-	-	-	-
<i>Pseudopolydora sp.</i>		-	-	-	-
<i>Scolecopsis texana</i>		-	-	-	-
<i>Spio sp.</i>		-	-	-	-
Spionidae (LPIL)		-	-	-	-
<i>Streblospio benedicti</i>		129	201	316	187
<b>Family: Terebellidae</b>					
<i>Loimia medusa</i>		-	-	-	-
<i>Loimia sp.</i>		-	-	-	-
<i>Pista cristata</i>		-	-	-	-
Terebellidae (LPIL)		-	-	-	-
<b>Order: Capitellida</b>					
<b>Family: Capitellidae</b>					
<i>Capitella capitata</i> complex Blake		-	-	-	-
<i>Capitella jonesi</i>		-	-	-	-
<i>Capitella sp.</i>		-	-	-	-
Capitellidae (LPIL)		-	-	-	-
<i>Heteromastus filiformis</i>		14	14	-	-
<i>Mediomastus ambiseta</i>		187	14	14	-
<i>Mediomastus californiensis</i>		-	-	-	-
<i>Mediomastus sp.</i>		517	72	115	101
<b>Order: Orbiniida</b>					
<b>Family: Orbiniidae</b>					
<i>Leitoscoloplos fragilis</i>		43	-	14	-
<i>Leitoscoloplos sp.</i>		-	-	-	-
Orbiniidae (LPIL)		-	-	-	-
<i>Scoloplos rubra</i>		14	-	-	-
<b>Order: Phyllodocida</b>					
<b>Family: Pilargidae</b>					
<i>Sigambra tentaculata</i>		-	14	14	-
<b>Order: Unspecified</b>					
<b>Family: Maldanidae</b>					
<i>Clymenella torquata</i>		-	-	-	-
<b>Class: Clitellata</b>					
<b>Order: Haplotaenidia</b>					
<b>Family: Naididae</b>					
<i>Paranais frici</i>		-	-	-	-
<b>Family: Tubificoid Naididae</b>					
Tubificoid Naididae imm. w/o hair setae (LPIL)		29	14	57	-
<i>Tubificoides sp.</i>		-	-	-	-
<b>Phylum: Arthropoda</b>					
<b>Class: Malacostraca</b>					
<b>Order: Amphipoda</b>					
<b>Family: Aoridae</b>					
Aoridae (LPIL)		-	-	-	-



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<b>Family: Corophiidae</b>					
<i>Monocorophium acherusicum</i>		-	-	-	-
<i>Monocorophium insidiosum</i>		-	-	-	-
<i>Monocorophium</i> sp.		-	-	-	-
<b>Family: Liljeborgiidae</b>					
<i>Listriella clymenellae</i>		-	-	-	-
<b>Order: Cumacea</b>					
<b>Family: Bodotriidae</b>					
<i>Cyclaspis varians</i>		-	-	-	-
<b>Family: Leuconidae</b>					
<i>Leucon americanus</i>		-	14	-	14
<b>Family: Unspecified</b>					
Cumacea (LPIL)		-	-	-	-
<b>Order: Decapoda</b>					
<b>Family: Alpheidae</b>					
<i>Alpheus</i> sp.		-	-	-	-
<b>Family: Palaemonidae</b>					
<i>Palaemonetes</i> sp.		-	-	-	-
<b>Family: Panopeidae</b>					
Panopeidae (LPIL)		-	-	-	-
<i>Panopeus herbstii</i>		-	-	-	-
<i>Rhithropanopeus harrisi</i>		-	-	-	-
<b>Family: Pinnotheridae</b>					
<i>Pinnixa</i> sp.		-	-	-	-
<b>Family: Portunidae</b>					
<i>Callinectes</i> sp.		-	-	-	-
Portunidae (LPIL)		-	-	-	-
<b>Family: Unspecified</b>					
Decapoda (LPIL)		-	-	-	-
Decapoda (zoea)		-	-	-	-
Decapoda zoea (larva)		-	-	-	-
<b>Order: Isopoda</b>					
<b>Family: Idoteidae</b>					
<i>Edotia triloba</i>		14	14	-	-
<b>Order: Leptostraca</b>					
<b>Family: Unspecified</b>					
Leptostraca (LPIL)		-	-	-	-
<b>Order: Mysida</b>					
<b>Family: Mysidae</b>					
<i>Americamysis bigelowi</i>		-	14	-	29
<i>Americamysis</i> sp.		-	-	-	-
Mysidae (LPIL)		-	-	-	-
<i>Neomysis americana</i>		-	-	-	-
<b>Family: Unspecified</b>					
Mysidacea (LPIL)		-	-	-	-
<b>Order: Stomatopoda</b>					
<b>Family: Squillidae</b>					



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<i>Squilla empusa</i>		-	-	-	-
<b>Class: Maxillopoda</b>					
<b>Order: Sessilia</b>					
<b>Family: Balanoidea</b>					
<i>Balanus improvisus</i>		-	-	-	-
<b>Family: Balanomorph</b>					
<i>Balanomorph</i> (LPIL)		-	-	-	-
<b>Class: Entognatha</b>					
<b>Order: Collembola</b>					
<b>Family: Unspecified</b>					
<i>Collembola</i> (LPIL)		-	-	-	-
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
<i>Crustacea</i> (LPIL)		-	-	-	-
<b>Phylum: Mollusca</b>					
<b>Class: Gastropoda</b>					
<b>Order: Cephalaspidea</b>					
<b>Family: Cylichnidae</b>					
<i>Acteocina canaliculata</i>		86	72	72	57
<i>Acteocina</i> sp.		-	-	-	-
<b>Order: Heterostroph</b>					
<b>Family: Pyramidellidae</b>					
<i>Odostomia engonia</i>		14	29	14	-
<b>Order: Heterostroph</b>					
<b>Family: Pyramidellidae</b>					
<i>Turbonilla interrupta</i>		14	-	-	-
<b>Order: Neogastropoda</b>					
<b>Family: Columbelloidea</b>					
<i>Astyris lunata</i>		-	-	-	-
<i>Nassarius vibex</i>		-	-	-	-
<b>Family: Conidae</b>					
<i>Pyrgocythara plicosa</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Calyptraeidae</b>					
<i>Crepidula fornicata</i>		-	-	-	-
<i>Crepidula plana</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Cerithiopsidae</b>					
<i>Cerithiopsis greenii</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Epitoniidae</b>					
<i>Epitonium rupicola</i>		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
<i>Gastropoda</i> (LPIL)		-	-	-	-
<b>Class: Bivalvia</b>					



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW07-F5-SD401 LW07-F5- SD401-00-10C 09/11/10	LW07-H3-SD401 LW07-H3- SD401-00-10C 09/11/10	LW07-J4-SD401 LW07-J4- SD401-00-10C 09/11/10	LW07-K3-SD401 LW07-K3- SD401-00-10C 09/11/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	14	29	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	14	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	29	-	14	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Bivalvia (LPIL)	-	-	-	14
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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**Prepared For:** CH2M HILL

**Project:** Navy Clean III

**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)

**Report Date:** 11/08/2010

<b>Taxonomic Classification</b>	Station Replicate Collection Date	LW07-F5-SD401 LW07-F5- SD401-00-10C 09/11/10	LW07-H3-SD401 LW07-H3- SD401-00-10C 09/11/10	LW07-J4-SD401 LW07-J4- SD401-00-10C 09/11/10	LW07-K3-SD401 LW07-K3- SD401-00-10C 09/11/10
Phoronida (LPIL)		172	29	43	72
<b>Phylum: Echinodermata</b>					
<b>Class: Ophiuroidea</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Ophiuroidea (LPIL)		-	-	-	14
<b>Phylum: Chordata</b>					
<b>Class: Cephalochordata</b>					
<b>Order: Amphioxiformes</b>					
<b>Family: Branchiostomatidae</b>					
Branchiostoma sp.		-	-	-	-
<b>No Organisms Present</b>		-	-	-	-
<b>Total Organisms</b>		1739	747	1020	1078
<b>Total Taxa</b>		27	18	15	13



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<b>Phylum: Porifera</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Porifera (LPIL)		-	14	-	14
<b>Phylum: Cnidaria</b>					
<b>Class: Hydrozoa</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Hydrozoa (LPIL)		-	-	-	-
<b>Class: Anthozoa</b>					
<b>Order: Actiniaria</b>					
<b>Family: Unspecified</b>					
Actiniaria (LPIL)		-	-	-	-
Actiniaria sp. A		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Anthozoa (LPIL)		-	-	-	-
<b>Phylum: Nemertea</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Nemertea (LPIL)		-	-	-	-
Nemertea sp. A (LPIL)		-	-	-	-
Nemertea sp. B (LPIL)		-	-	-	-
Nemertea sp. C (LPIL)		-	-	-	-
Nemertea sp. D (LPIL)		-	-	-	-
<b>Phylum: Annelida</b>					
<b>Class: Polychaeta</b>					
<b>Order: Aciculata</b>					
<b>Family: Dorvilleidae</b>					
Dorvillea ( <i>Schistomerings</i> ) <i>rudolphi</i>		-	-	-	-
Dorvilleidae (LPIL)		-	-	-	-
<b>Family: Eunicidae</b>					
Marphysa <i>sanguinea</i>		-	-	-	-
<b>Family: Glyceridae</b>					
Glycera <i>americana</i>		-	-	-	-
Glycera <i>dibranchiata</i>		-	-	-	-
Glycera sp.		-	-	-	-
Ophioglycera sp.		-	-	-	-
<b>Family: Goniadidae</b>					
Glycinde <i>solitaria</i>		14	14	-	-
<b>Family: Hesionidae</b>					
Gyptis <i>crypta</i>		-	29	-	-
Hesionidae (LPIL)		-	-	-	-
Podarke <i>obscura</i>		-	-	-	-
<b>Family: Nereididae</b>					



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<i>Laonereis culveri</i>		-	-	-	-
<i>Neanthes succinea</i>		-	-	-	-
Nereididae (LPIL)		-	-	-	-
<i>Platynereis dumerillii</i>		-	-	-	-
<b>Family: Oeononidae</b>					
<i>Drilonereis longa</i>		-	-	-	-
<b>Family: Onuphidae</b>					
<i>Diopatra cuprea</i>		-	-	-	-
<b>Family: Phyllodocidae</b>					
<i>Eteone</i> sp.		-	-	-	-
<i>Eumida sanguinea</i>		-	-	-	-
<i>Phyllodoce mucosa</i>		-	-	-	-
Phyllodocidae (LPIL)		-	-	-	-
<b>Family: Polynoidae</b>					
<i>Lepidonotus</i> sp.		-	-	-	-
<b>Family: Syllidae</b>					
<i>Grubeosyllis clavata</i>		-	-	-	-
Syllidae (LPIL)		-	-	-	-
<b>Order: Canalipalpata</b>					
<b>Family: Ampharetidae</b>					
Ampharetidae (LPIL)		-	-	-	-
<b>Family: Chaetopteridae</b>					
<i>Spiochaetopterus costarum</i>		-	14	-	-
<b>Family: Cirratulidae</b>					
<i>Aphelochaeta</i> sp.		-	-	-	-
Cirratulidae (LPIL)		388	29	-	-
<i>Tharyx</i> sp.		201	-	14	-
<b>Family: Pectinariidae</b>					
<i>Pectinaria gouldii</i>		-	-	-	-
<i>Pectinaria</i> sp.		-	-	-	-
<b>Family: Sabellidae</b>					
<i>Demonax microphthalmus</i>		-	-	-	-
<i>Sabellaria vulgaris</i>		-	-	-	-
Sabellidae (LPIL)		-	-	-	-
Sabellinae (LPIL)		-	-	-	-
<b>Family: Serpulidae</b>					
<i>Hydroides dianthus</i>		-	-	-	-
<b>Family: Serpulidae</b>					
<i>Hydroides diathus</i>		-	-	-	-
<b>Family: Serpulidae</b>					
<i>Hydroides</i> sp.		-	-	-	-
Serpulidae (LPIL)		-	-	-	-
<b>Family: Spionidae</b>					
<i>Apoprionospio pygmaea</i>		-	-	-	-
<i>Dipolydora cauleri</i>		-	-	-	-
<i>Dipolydora socialis</i>		-	-	-	-
<i>Marenzelleria viridis</i>		-	-	-	-





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<i>Minuspio</i> sp.		-	-	-	-
<i>Paraprionospio pinnata</i>		57	158	57	-
<i>Polydora cornuta</i>		-	-	-	-
<i>Pseudopolydora</i> sp.		-	-	-	-
<i>Scoelepis texana</i>		-	-	-	-
<i>Spio</i> sp.		-	-	-	-
Spionidae (LPIL)		14	-	-	-
<i>Streblospio benedicti</i>		29	101	57	489
<b>Family: Terebellidae</b>					
<i>Loimia medusa</i>		-	-	-	-
<i>Loimia</i> sp.		-	-	-	-
<i>Pista cristata</i>		-	-	-	-
Terebellidae (LPIL)		-	-	-	-
<b>Order: Capitellida</b>					
<b>Family: Capitellidae</b>					
<i>Capitella capitata</i> complex Blake		-	-	-	-
<i>Capitella jonesi</i>		-	-	-	-
<i>Capitella</i> sp.		-	-	-	14
Capitellidae (LPIL)		-	-	-	-
<i>Heteromastus filiformis</i>		-	-	-	-
<i>Mediomastus ambiseta</i>		14	57	-	29
<i>Mediomastus californiensis</i>		-	-	-	-
<i>Mediomastus</i> sp.		-	43	129	-
<b>Order: Orbiniida</b>					
<b>Family: Orbiniidae</b>					
<i>Leitoscoloplos fragilis</i>		-	-	-	-
<i>Leitoscoloplos</i> sp.		-	-	-	-
Orbiniidae (LPIL)		-	-	-	-
<i>Scoloplos rubra</i>		-	-	-	-
<b>Order: Phyllodocida</b>					
<b>Family: Pilargidae</b>					
<i>Sigambra tentaculata</i>		29	29	14	-
<b>Order: Unspecified</b>					
<b>Family: Maldanidae</b>					
<i>Clymenella torquata</i>		-	-	-	-
<b>Class: Clitellata</b>					
<b>Order: Haplotaxida</b>					
<b>Family: Naididae</b>					
<i>Paranais frici</i>		-	-	-	-
<b>Family: Tubificoid Naididae</b>					
Tubificoid Naididae imm. w/o hair setae (LPIL)		-	-	14	-
<i>Tubificoides</i> sp.		-	-	-	-
<b>Phylum: Arthropoda</b>					
<b>Class: Malacostraca</b>					
<b>Order: Amphipoda</b>					
<b>Family: Aoridae</b>					
Aoridae (LPIL)		-	-	-	-



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<b>Family: Corophiidae</b>					
<i>Monocorophium acherusicum</i>		-	-	-	-
<i>Monocorophium insidiosum</i>		-	-	-	-
<i>Monocorophium</i> sp.		-	-	-	-
<b>Family: Liljeborgiidae</b>					
<i>Listriella clymenellae</i>		-	-	-	-
<b>Order: Cumacea</b>					
<b>Family: Bodotriidae</b>					
<i>Cyclops varians</i>		-	-	-	-
<b>Family: Leuconidae</b>					
<i>Leucon americanus</i>		-	14	-	-
<b>Family: Unspecified</b>					
Cumacea (LPIL)		-	-	-	-
<b>Order: Decapoda</b>					
<b>Family: Alpheidae</b>					
<i>Alpheus</i> sp.		-	-	-	-
<b>Family: Palaemonidae</b>					
<i>Palaemonetes</i> sp.		-	-	-	-
<b>Family: Panopeidae</b>					
Panopeidae (LPIL)		-	-	-	-
<i>Panopeus herbstii</i>		-	-	-	-
<i>Rhithropanopeus harrisii</i>		-	-	-	-
<b>Family: Pinnotheridae</b>					
<i>Pinnixa</i> sp.		-	-	-	-
<b>Family: Portunidae</b>					
<i>Callinectes</i> sp.		-	-	-	-
Portunidae (LPIL)		-	-	-	-
<b>Family: Unspecified</b>					
Decapoda (LPIL)		-	-	-	-
Decapoda (zoea)		-	-	-	-
Decapoda zoea (larva)		-	-	-	-
<b>Order: Isopoda</b>					
<b>Family: Idoteidae</b>					
<i>Edotia triloba</i>		-	-	-	-
<b>Order: Leptostraca</b>					
<b>Family: Unspecified</b>					
Leptostraca (LPIL)		-	-	-	-
<b>Order: Mysida</b>					
<b>Family: Mysidae</b>					
<i>Americamysis bigelowi</i>		-	14	-	-
<i>Americamysis</i> sp.		-	-	-	-
Mysidae (LPIL)		-	-	-	-
<i>Neomysis americana</i>		-	-	-	-
<b>Family: Unspecified</b>					
Mysidacea (LPIL)		-	-	-	-
<b>Order: Stomatopoda</b>					
<b>Family: Squillidae</b>					



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<i>Squilla empusa</i>		-	-	-	-
<b>Class: Maxillopoda</b>					
<b>Order: Sessilia</b>					
<b>Family: Balanoidea</b>					
<i>Balanus improvisus</i>		-	-	-	-
<b>Family: Balanomorpha</b>					
Balanomorpha (LPIL)		-	-	-	-
<b>Class: Entognatha</b>					
<b>Order: Collembola</b>					
<b>Family: Unspecified</b>					
Collembola (LPIL)		-	-	-	-
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Crustacea (LPIL)		-	-	-	-
<b>Phylum: Mollusca</b>					
<b>Class: Gastropoda</b>					
<b>Order: Cephalaspidea</b>					
<b>Family: Cylichnidae</b>					
<i>Acteocina canaliculata</i>		14	29	86	29
<i>Acteocina</i> sp.		-	-	-	-
<b>Order: Heterostrophia</b>					
<b>Family: Pyramidellidae</b>					
<i>Odostomia engonia</i>		-	-	-	-
<b>Order: Heterostrophia</b>					
<b>Family: Pyramidellidae</b>					
<i>Turbonilla interrupta</i>		-	-	-	-
<b>Order: Neogastropoda</b>					
<b>Family: Columbellidae</b>					
<i>Astyris lunata</i>		-	-	-	-
<i>Nassarius vibex</i>		-	-	-	-
<b>Family: Conidae</b>					
<i>Pyrgocythara plicosa</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Calyptraeidae</b>					
<i>Crepidula fornicata</i>		-	-	-	-
<i>Crepidula plana</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Cerithiopsidae</b>					
<i>Cerithiopsis greenii</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Epitoniidae</b>					
<i>Epitonium rupicola</i>		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Gastropoda (LPIL)		-	-	-	-
<b>Class: Bivalvia</b>					



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<b>Order: Arcoida</b>					
<b>Family: Arcidae</b>					
<i>Anadara transversa</i>		-	-	-	-
<b>Order: Mytiloida</b>					
<b>Family: Mytilidae</b>					
<i>Amygdalum papyrium</i>		-	-	-	-
<b>Order: Ostreoida</b>					
<b>Family: Anomiidae</b>					
<i>Anomia simplex</i>		-	-	-	-
<b>Order: Ostreoida</b>					
<b>Family: Anomiidae</b>					
<i>Pododesmus rudis</i>		-	-	-	-
<b>Order: Ostreoida</b>					
<b>Family: Ostreidae</b>					
<i>Crassostrea virginica</i>		-	-	-	-
<b>Order: Pholadomyoida</b>					
<b>Family: Lyonsiidae</b>					
<i>Lyonsia hyalina</i>		-	-	-	-
<b>Order: Veneroida</b>					
<b>Family: Mactridae</b>					
Mactridae (LPIL)		14	14	14	-
<i>Mulinia lateralis</i>		-	-	-	-
<i>Mulinia lateralis</i>		-	-	-	-
<b>Family: Petricolidae</b>					
<i>Petricolaria pholadiformis</i>		-	-	-	-
<b>Family: Solecurtidae</b>					
<i>Tagelus plebeius</i>		-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-
<b>Family: Tellinidae</b>					
<i>Macoma tenta</i>		-	-	-	-
Tellinidae (LPIL)		14	-	-	-
<b>Family: Veneridae</b>					
<i>Gemma gemma</i>		-	-	-	-
<b>Order: Veneroida</b>					
<b>Family: Veneridae</b>					
<i>Mercenaria mercenaria</i>		14	-	-	-
<b>Order: Veneroida</b>					
<b>Family: Veneridae</b>					
<i>Pitar</i> sp.		-	-	-	-
Veneridae (LPIL)		-	-	14	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Bivalvia (LPIL)		-	-	-	-
<b>Phylum: Phoronida</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

<b>Taxonomic Classification</b>	Station Replicate Collection Date	LW07-K4-SD401 LW07-K4- SD401-00-10C 09/11/10	LW07-K5-SD401 LW07-K5- SD401-00-10C 09/11/10	LW07-L2-SD401-01 LW07-L2- SD401-01-10C-01 09/11/10	LW07-H1-SD401-01 LW07-H1- SD401-00-10C-01 09/10/10
Phoronida (LPIL)		43	-	14	-
<b>Phylum: Echinodermata</b>					
<b>Class: Ophiuroidea</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Ophiuroidea (LPIL)		-	-	-	-
<b>Phylum: Chordata</b>					
<b>Class: Cephalochordata</b>					
<b>Order: Amphioxiformes</b>					
<b>Family: Branchiostomatidae</b>					
Branchiostoma sp.		-	-	-	-
<b>No Organisms Present</b>		-	-	-	-
<b>Total Organisms</b>		848	560	417	575
<b>Total Taxa</b>		13	14	10	5



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Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

Taxonomic Classification	Station Replicate Collection Date	LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10	LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10	LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10	LW07-SD401 LW07-SD401-00-10C 09/11/10
<b>Phylum: Porifera</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Porifera (LPIL)		14	-	14	-
<b>Phylum: Cnidaria</b>					
<b>Class: Hydrozoa</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Hydrozoa (LPIL)		-	-	14	-
<b>Class: Anthozoa</b>					
<b>Order: Actiniaria</b>					
<b>Family: Unspecified</b>					
Actiniaria (LPIL)		14	-	-	14
Actiniaria sp. A		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Anthozoa (LPIL)		-	-	-	-
<b>Phylum: Nemertea</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Nemertea (LPIL)		-	-	-	-
Nemertea sp. A (LPIL)		-	-	-	-
Nemertea sp. B (LPIL)		-	-	-	-
Nemertea sp. C (LPIL)		-	-	-	-
Nemertea sp. D (LPIL)		-	-	-	-
<b>Phylum: Annelida</b>					
<b>Class: Polychaeta</b>					
<b>Order: Aciculata</b>					
<b>Family: Dorvilleidae</b>					
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>		-	-	-	-
Dorvilleidae (LPIL)		-	-	-	-
<b>Family: Eunicidae</b>					
Marphysa <i>sanguinea</i>		-	-	-	-
<b>Family: Glyceridae</b>					
Glycera <i>americana</i>		-	-	-	-
Glycera <i>dibranchiata</i>		-	-	14	-
Glycera sp.		-	-	-	-
Ophioglycera sp.		-	-	-	-
<b>Family: Goniadidae</b>					
Glycinde <i>solitaria</i>		14	-	-	-
<b>Family: Hesionidae</b>					
Gyptis <i>crypta</i>		-	-	-	14
Hesionidae (LPIL)		-	-	-	-
Podarke <i>obscura</i>		-	-	-	-
<b>Family: Nereididae</b>					



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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

Taxonomic Classification	Station Replicate Collection Date	LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10	LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10	LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10	LW07-SD401 LW07-SD401-00-10C 09/11/10
<i>Laeonereis culveri</i>		-	-	-	-
<i>Neanthes succinea</i>		-	-	-	-
Nereididae (LPIL)		-	-	-	-
<i>Platynereis dumerilii</i>		-	-	-	-
<b>Family: Oeonidae</b>					
<i>Drilonereis longa</i>		-	-	-	-
<b>Family: Onuphidae</b>					
<i>Diopatra cuprea</i>		-	-	-	-
<b>Family: Phyllodoceidae</b>					
<i>Eteone</i> sp.		-	-	-	-
<i>Eumida sanguinea</i>		-	-	-	-
<i>Phyllodoce mucosa</i>		-	-	-	-
Phyllodoceidae (LPIL)		-	-	-	-
<b>Family: Polynoidae</b>					
<i>Lepidonotus</i> sp.		-	-	-	-
<b>Family: Syllidae</b>					
<i>Grubeosyllis clavata</i>		-	-	-	-
Syllidae (LPIL)		-	-	-	-
<b>Order: Canalipalpata</b>					
<b>Family: Ampharetidae</b>					
Ampharetidae (LPIL)		-	-	-	-
<b>Family: Chaetopteridae</b>					
<i>Spiochaetopterus costarum</i>		-	-	14	-
<b>Family: Cirratulidae</b>					
<i>Apelochaeta</i> sp.		-	-	-	-
Cirratulidae (LPIL)		-	-	-	14
<i>Tharyx</i> sp.		-	-	187	-
<b>Family: Pectinariidae</b>					
<i>Pectinaria gouldii</i>		-	-	14	-
<i>Pectinaria</i> sp.		-	-	-	-
<b>Family: Sabellidae</b>					
<i>Demonax microphthalmus</i>		-	-	-	-
<i>Sabellaria vulgaris</i>		-	-	-	-
Sabellidae (LPIL)		-	-	-	-
Sabellinae (LPIL)		-	-	-	-
<b>Family: Serpulidae</b>					
<i>Hydroides dianthus</i>		-	-	-	-
<b>Family: Serpulidae</b>					
<i>Hydroides dianthus</i>		-	-	-	-
<b>Family: Serpulidae</b>					
<i>Hydroides</i> sp.		-	-	-	-
Serpulidae (LPIL)		-	-	-	-
<b>Family: Spionidae</b>					
<i>Apoprionospio pygmaea</i>		-	-	-	-
<i>Dipolydora cauleri</i>		-	-	-	-
<i>Dipolydora socialis</i>		-	-	-	-
<i>Marenzelleria viridis</i>		-	-	-	-



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Report Date: 11/08/2010

Taxonomic Classification	Station Replicate Collection Date	LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10	LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10	LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10	LW07-SD401 LW07-SD401-00-10C 09/11/10
<i>Minuspio</i> sp.		-	-	-	-
<i>Paraprionospio pinnata</i>		-	43	14	14
<i>Polydora cornuta</i>		29	-	14	-
<i>Pseudopolydora</i> sp.		-	-	-	-
<i>Scoelelepis texana</i>		-	-	-	-
<i>Spio</i> sp.		-	-	-	-
Spionidae (LPIL)		-	-	-	-
<i>Streblospio benedicti</i>		589	57	747	445
<b>Family: Terebellidae</b>					
<i>Loimia medusa</i>		-	-	-	-
<i>Loimia</i> sp.		-	-	-	-
<i>Pista cristata</i>		-	-	-	-
Terebellidae (LPIL)		-	-	-	-
<b>Order: Capitellida</b>					
<b>Family: Capitellidae</b>					
<i>Capitella capitata</i> complex Blake		14	-	14	-
<i>Capitella jonesi</i>		29	-	-	-
<i>Capitella</i> sp.		-	-	-	-
Capitellidae (LPIL)		-	-	-	-
<i>Heteromastus filiformis</i>		-	-	-	-
<i>Mediomastus ambiseta</i>		-	-	101	-
<i>Mediomastus californiensis</i>		-	-	-	-
<i>Mediomastus</i> sp.		29	-	29	14
<b>Order: Orbiniida</b>					
<b>Family: Orbiniidae</b>					
<i>Leitoscoloplos fragilis</i>		-	-	-	-
<i>Leitoscoloplos</i> sp.		-	14	-	-
Orbiniidae (LPIL)		-	-	-	-
<i>Scoloplos rubra</i>		-	-	-	-
<b>Order: Phyllodocida</b>					
<b>Family: Pilargidae</b>					
<i>Sigambra tentaculata</i>		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Maldanidae</b>					
<i>Clymenella torquata</i>		-	-	-	-
<b>Class: Clitellata</b>					
<b>Order: Haplotaxida</b>					
<b>Family: Naididae</b>					
<i>Paranais frici</i>		-	-	-	-
<b>Family: Tubificoid Naididae</b>					
Tubificoid Naididae imm. w/o hair setae (LPIL)		14	-	29	43
<i>Tubificoides</i> sp.		-	-	-	-
<b>Phylum: Arthropoda</b>					
<b>Class: Malacostraca</b>					
<b>Order: Amphipoda</b>					
<b>Family: Aoridae</b>					
Aoridae (LPIL)		-	-	-	-





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2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

<b>Taxonomic Classification</b>	<b>Station Replicate Collection Date</b>	<b>LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10</b>	<b>LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10</b>	<b>LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10</b>	<b>LW07-SD401 LW07-SD401-00-10C 09/11/10</b>
<b>Family: Corophiidae</b>					
<i>Monocorophium acherusicum</i>		-	-	-	-
<i>Monocorophium insidiosum</i>		-	-	-	-
<i>Monocorophium</i> sp.		-	-	-	-
<b>Family: Liljeborgiidae</b>					
<i>Listriella clymenellae</i>		-	-	-	-
<b>Order: Cumacea</b>					
<b>Family: Bodotriidae</b>					
<i>Cyclaspis varians</i>		-	-	14	-
<b>Family: Leuconidae</b>					
<i>Leucon americanus</i>		-	-	-	-
<b>Family: Unspecified</b>					
Cumacea (LPIL)		-	-	-	14
<b>Order: Decapoda</b>					
<b>Family: Alpheidae</b>					
<i>Alpheus</i> sp.		-	-	-	14
<b>Family: Palaemonidae</b>					
<i>Palaemonetes</i> sp.		-	-	-	-
<b>Family: Panopeidae</b>					
Panopeidae (LPIL)		-	-	-	-
<i>Panopeus herbstii</i>		-	-	-	-
<i>Rhithropanopeus harrisi</i>		-	-	-	-
<b>Family: Pinnotheridae</b>					
<i>Pinnixa</i> sp.		-	-	-	-
<b>Family: Portunidae</b>					
<i>Callinectes</i> sp.		-	-	-	-
Portunidae (LPIL)		-	-	-	-
<b>Family: Unspecified</b>					
Decapoda (LPIL)		-	14	-	14
Decapoda (zoea)		-	-	-	-
Decapoda zoea (larva)		-	-	-	-
<b>Order: Isopoda</b>					
<b>Family: Idoteidae</b>					
<i>Edotia triloba</i>		-	-	-	-
<b>Order: Leptostraca</b>					
<b>Family: Unspecified</b>					
Leptostraca (LPIL)		-	-	-	-
<b>Order: Mysida</b>					
<b>Family: Mysidae</b>					
<i>Americamysis bigelowi</i>		-	-	-	-
<i>Americamysis</i> sp.		-	-	-	-
Mysidae (LPIL)		-	-	-	-
<i>Neomysis americana</i>		-	-	-	-
<b>Family: Unspecified</b>					
Mysidacea (LPIL)		14	-	-	-
<b>Order: Stomatopoda</b>					
<b>Family: Squillidae</b>					



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Taxonomic Classification	Station Replicate Collection Date	LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10	LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10	LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10	LW07-SD401 LW07-SD401-00-10C 09/11/10
<i>Squilla empusa</i>		-	-	-	-
<b>Class: Maxillopoda</b>					
<b>Order: Sessilia</b>					
<b>Family: Balanoidea</b>					
<i>Balanus improvisus</i>		-	-	-	-
<b>Family: Balanomorpha</b>					
Balanomorpha (LPIL)		-	-	-	-
<b>Class: Entognatha</b>					
<b>Order: Collembola</b>					
<b>Family: Unspecified</b>					
Collembola (LPIL)		-	-	-	-
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Crustacea (LPIL)		-	-	-	-
<b>Phylum: Mollusca</b>					
<b>Class: Gastropoda</b>					
<b>Order: Cephalaspidea</b>					
<b>Family: Cylichnidae</b>					
<i>Acteocina canaliculata</i>		-	43	14	29
<i>Acteocina</i> sp.		-	-	-	-
<b>Order: Heterostropho</b>					
<b>Family: Pyramidellidae</b>					
<i>Odostomia engonia</i>		-	-	-	-
<b>Order: Heterostropho</b>					
<b>Family: Pyramidellidae</b>					
<i>Turbonilla interrupta</i>		-	-	-	-
<b>Order: Neogastropoda</b>					
<b>Family: Columbellidae</b>					
<i>Astyris lunata</i>		-	-	-	-
<i>Nassarius vibex</i>		-	-	-	-
<b>Family: Conidae</b>					
<i>Pyrgocythara plicosa</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Calyptraeidae</b>					
<i>Crepidula fornicata</i>		-	-	-	-
<i>Crepidula plana</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Cerithiopsidae</b>					
<i>Cerithiopsis greenii</i>		-	-	-	-
<b>Order: Neotaenioglossa</b>					
<b>Family: Epitoniidae</b>					
<i>Epitonium rupicola</i>		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Gastropoda (LPIL)		-	-	-	14
<b>Class: Bivalvia</b>					



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2010

**Sample Method:** Petite Ponar (x3)  
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#### Taxonomic Classification

Station Replicate Collection Date	LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10	LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10	LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10	LW07-SD401 LW07-SD401-00-10C 09/11/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	29	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	14	14	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	14	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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**Project:** Navy Clean III

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2010

**Sample Method:** Petite Ponar (x3)

**Report Date:** 11/08/2010

<b>Taxonomic Classification</b>	Station Replicate Collection Date	LW07-K1-SD401 LW07-K1- SD401-00-10C 09/10/10	LW07-L5-SD401 LW07-L5- SD401-00-10C 09/11/10	LW07-M1-SD401 LW07-M1- SD401-00-10C 09/10/10	LW07-SD401 LW07-SD401-00-10C 09/11/10
Phoronida (LPIL)		-	-	-	-
<b>Phylum: Echinodermata</b>					
<b>Class: Ophiuroidea</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Ophiuroidea (LPIL)		-	-	-	-
<b>Phylum: Chordata</b>					
<b>Class: Cephalochordata</b>					
<b>Order: Amphioxiformes</b>					
<b>Family: Branchiostomatidae</b>					
Branchiostoma sp.		-	-	-	-
<b>No Organisms Present</b>		-	-	-	-
<b>Total Organisms</b>		776	216	1250	647
<b>Total Taxa</b>		11	7	16	12



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	14	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>	-	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>	-	-	-	-
Glycera <i>dibranchiata</i>	-	-	-	-
Glycera sp.	-	-	-	-
Ophioglycera sp.	-	-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>	29	-	-	-
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>	14	-	-	-
Hesionidae (LPIL)	-	-	-	-
Podarke <i>obscura</i>	-	-	-	-
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	14	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	14	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	14	-	144	-
<i>Tharyx</i> sp.	72	-	43	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	29	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	14	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	86	-	72	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scoelepis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	963	445	632	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	-	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	-	-	-	-
<i>Mediomastus ambiseta</i>	417	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	273	14	503	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	14	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaxida</b>				
<b>Family: Naididae</b>				
<i>Paranaïs frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	57	14	-	-
<i>Tubificoides</i> sp.	-	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	14	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	14	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	14	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	14	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				





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**Prepared For:** CH2M HILL  
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**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
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#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	29	-	43	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	43	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	14	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	14	14	14	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	29	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW07-SD402 LW07-SD402-00-10C 09/11/10	LW07-SD403-01 LW07-SD403-00-10C-01 09/11/10	LW07-SD404 LW07-SD404-00-10C 09/10/10	LW03-SD534-02 LW03-SD534-02-10C 09/01/10
Phoronida (LPIL)	43	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
<i>Branchiostoma sp.</i>	-	-	-	-
<b>No Organisms Present</b>	-	-	-	✓
<b>Total Organisms</b>	2098	603	1494	14
<b>Total Taxa</b>	17	10	9	N/A



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### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)	-	-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)	-	-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)	-	-	-	-
Actiniaria sp. A	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)	-	-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)	-	-	-	-
Nemertea sp. A (LPIL)	-	-	-	-
Nemertea sp. B (LPIL)	-	-	-	-
Nemertea sp. C (LPIL)	-	-	-	-
Nemertea sp. D (LPIL)	-	-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
<i>Dorvillea (Schistomeringos) rudolphi</i>	86	-	-	-
Dorvilleidae (LPIL)	-	-	-	-
<b>Family: Eunicidae</b>				
<i>Marphysa sanguinea</i>	-	-	-	-
<b>Family: Glyceridae</b>				
<i>Glycera americana</i>	-	-	-	-
<i>Glycera dibranchiata</i>	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-
<i>Ophioglycera</i> sp.	-	-	-	-
<b>Family: Goniadidae</b>				
<i>Glycinde solitaria</i>	29	-	-	-
<b>Family: Hesionidae</b>				
<i>Gyptis crypta</i>	43	-	-	-
Hesionidae (LPIL)	57	-	-	-
<i>Podarke obscura</i>	72	-	-	-
<b>Family: Nereididae</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
<i>Laeonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeononidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelochaeta</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-
<i>Tharyx</i> sp.	-	-	-	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	14	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	29	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apopriospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
<i>Minuspio</i> sp.	-	-	-	-
<i>Paraprionospio pinnata</i>	101	-	-	-
<i>Polydora cornuta</i>	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-
<i>Scolecopsis texana</i>	-	-	-	-
<i>Spio</i> sp.	-	-	-	-
Spionidae (LPIL)	-	-	-	-
<i>Streblospio benedicti</i>	-	14	-	-
<b>Family: Terebellidae</b>				
<i>Loimia medusa</i>	-	-	-	-
<i>Loimia</i> sp.	-	-	-	-
<i>Pista cristata</i>	-	-	-	-
Terebellidae (LPIL)	43	-	-	-
<b>Order: Capitellida</b>				
<b>Family: Capitellidae</b>				
<i>Capitella capitata</i> complex Blake	-	-	-	-
<i>Capitella jonesi</i>	-	-	-	-
<i>Capitella</i> sp.	-	-	-	-
Capitellidae (LPIL)	-	-	-	-
<i>Heteromastus filiformis</i>	14	-	-	-
<i>Mediomastus ambiseta</i>	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-
<i>Mediomastus</i> sp.	14	-	-	-
<b>Order: Orbiniida</b>				
<b>Family: Orbiniidae</b>				
<i>Leitoscoloplos fragilis</i>	-	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-	-
Orbiniidae (LPIL)	-	-	-	-
<i>Scoloplos rubra</i>	-	-	-	-
<b>Order: Phyllodocida</b>				
<b>Family: Pilargidae</b>				
<i>Sigambra tentaculata</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Maldanidae</b>				
<i>Clymenella torquata</i>	-	-	-	-
<b>Class: Clitellata</b>				
<b>Order: Haplotaenidia</b>				
<b>Family: Naididae</b>				
<i>Paranais frici</i>	-	-	-	-
<b>Family: Tubificoid Naididae</b>				
Tubificoid Naididae imm. w/o hair setae (LPIL)	-	-	-	-
<i>Tubificoides</i> sp.	29	-	-	-
<b>Phylum: Arthropoda</b>				
<b>Class: Malacostraca</b>				
<b>Order: Amphipoda</b>				
<b>Family: Aoridae</b>				
Aoridae (LPIL)	-	-	-	-



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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	-	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	29	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	-	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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## Macroinvertebrate Results

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Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	14	-	-	-
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				





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Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	14	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	-	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	-	-
Veneridae (LPIL)	29	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	-	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL

Project: Navy Clean III

Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)

Report Date: 11/08/2010

#### Taxonomic Classification

Station Replicate Collection Date	LW03-SD534-03 LW03-SD534-03-10C 09/01/10	LW03-SD550-02 LW03-SD550-02-10C 09/08/10	LW03-SD550-03 LW03-SD550-03-10C 09/08/10	LW03-SD558-02 LW03-SD558-02-10C 09/08/10
Phoronida (LPIL)	-	-	-	-
<b>Phylum: Echinodermata</b>				
<b>Class: Ophiuroidea</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Ophiuroidea (LPIL)	-	-	-	-
<b>Phylum: Chordata</b>				
<b>Class: Cephalochordata</b>				
<b>Order: Amphioxiformes</b>				
<b>Family: Branchiostomatidae</b>				
Branchiostoma sp.	-	-	-	-
<b>No Organisms Present</b>	-	-	-	✓
<b>Total Organisms</b>	589	14	29	14
<b>Total Taxa</b>	15	1	1	N/A



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2010

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Taxonomic Classification	Station Replicate Collection Date	LW03-SD558-03 LW03-SD558-03-10C 09/08/10	LW07-L2-SD401-02 LW07-L2- SD401-02-10C-02 09/11/10	LW07-L2-SD401-03 LW07-L2- SD401-03-10C-03 09/11/10	LW07-H1-SD401-02 LW07-H1- SD401-00-10C-02 09/10/10
<b>Phylum: Porifera</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Porifera (LPIL)		-	14	-	-
<b>Phylum: Cnidaria</b>					
<b>Class: Hydrozoa</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Hydrozoa (LPIL)		-	-	-	-
<b>Class: Anthozoa</b>					
<b>Order: Actinaria</b>					
<b>Family: Unspecified</b>					
Actinaria (LPIL)		-	-	-	-
Actinaria sp. A		-	-	-	-
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Anthozoa (LPIL)		-	-	-	-
<b>Phylum: Nemertea</b>					
<b>Class: Unspecified</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Nemertea (LPIL)		-	-	-	-
Nemertea sp. A (LPIL)		-	-	-	-
Nemertea sp. B (LPIL)		-	-	-	-
Nemertea sp. C (LPIL)		-	-	14	-
Nemertea sp. D (LPIL)		-	-	-	-
<b>Phylum: Annelida</b>					
<b>Class: Polychaeta</b>					
<b>Order: Aciculata</b>					
<b>Family: Dorvilleidae</b>					
<i>Dorvillea (Schistomeringos) rudolphi</i>		-	-	-	-
Dorvilleidae (LPIL)		-	-	-	-
<b>Family: Eunicidae</b>					
<i>Marphysa sanguinea</i>		-	-	-	-
<b>Family: Glyceridae</b>					
<i>Glycera americana</i>		-	-	-	-
<i>Glycera dibranchiata</i>		-	-	-	-
<i>Glycera</i> sp.		-	-	-	-
<i>Ophioglycera</i> sp.		-	-	-	-
<b>Family: Goniadidae</b>					
<i>Glycinde solitaria</i>		-	-	14	-
<b>Family: Hesionidae</b>					
<i>Gyptis crypta</i>		-	-	-	-
Hesionidae (LPIL)		-	-	-	-
<i>Podarke obscura</i>		-	-	-	-
<b>Family: Nereididae</b>					



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<i>Laonereis culveri</i>	-	-	-	-
<i>Neanthes succinea</i>	-	-	-	-
Nereididae (LPIL)	-	-	-	-
<i>Platynereis dumerilii</i>	-	-	-	-
<b>Family: Oeonidae</b>				
<i>Drilonereis longa</i>	-	-	-	-
<b>Family: Onuphidae</b>				
<i>Diopatra cuprea</i>	-	-	-	-
<b>Family: Phyllodocidae</b>				
<i>Eteone</i> sp.	-	-	-	-
<i>Eumida sanguinea</i>	-	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-	-
Phyllodocidae (LPIL)	-	-	-	-
<b>Family: Polynoidae</b>				
<i>Lepidonotus</i> sp.	-	-	-	-
<b>Family: Syllidae</b>				
<i>Grubeosyllis clavata</i>	-	-	-	-
Syllidae (LPIL)	-	-	-	-
<b>Order: Canalipalpata</b>				
<b>Family: Ampharetidae</b>				
Ampharetidae (LPIL)	-	-	-	-
<b>Family: Chaetopteridae</b>				
<i>Spiochaetopterus costarum</i>	-	-	-	-
<b>Family: Cirratulidae</b>				
<i>Aphelocheata</i> sp.	-	-	-	-
Cirratulidae (LPIL)	-	14	-	-
<i>Tharyx</i> sp.	-	14	129	-
<b>Family: Pectinariidae</b>				
<i>Pectinaria gouldii</i>	-	-	-	-
<i>Pectinaria</i> sp.	-	-	-	-
<b>Family: Sabellidae</b>				
<i>Demonax microphthalmus</i>	-	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-	-
Sabellidae (LPIL)	-	-	-	-
Sabellinae (LPIL)	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides dianthus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides diathus</i>	-	-	-	-
<b>Family: Serpulidae</b>				
<i>Hydroides</i> sp.	-	-	-	-
Serpulidae (LPIL)	-	-	-	-
<b>Family: Spionidae</b>				
<i>Apoprionospio pygmaea</i>	-	-	-	-
<i>Dipolydora cauleri</i>	-	-	-	-
<i>Dipolydora socialis</i>	-	-	-	-
<i>Marenzelleria viridis</i>	-	-	-	-



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## Macroinvertebrate Results

### Data Per Square Meter (Unpooled)

Prepared For: CH2M HILL  
Project: Navy Clean III  
Sample Group: Navy Clean Aug-Sept  
2010

Sample Method: Petite Ponar (x3)  
Report Date: 11/08/2010

Taxonomic Classification	Station Replicate Collection Date	LW03-SD558-03 LW03-SD558-03-10C 09/08/10	LW07-L2-SD401-02 LW07-L2- SD401-02-10C-02 09/11/10	LW07-L2-SD401-03 LW07-L2- SD401-03-10C-03 09/11/10	LW07-H1-SD401-02 LW07-H1- SD401-00-10C-02 09/10/10
<i>Minuspio</i> sp.		-	-	-	-
<i>Paraprionospio pinnata</i>		-	43	43	14
<i>Polydora cornuta</i>		-	-	-	-
<i>Pseudopolydora</i> sp.		-	-	-	-
<i>Scoletepis texana</i>		-	-	-	-
<i>Spio</i> sp.		-	-	-	-
Spionidae (LPIL)		-	-	-	-
<i>Streblospio benedicti</i>		-	230	445	187
<b>Family: Terebellidae</b>					
<i>Loimia medusa</i>		-	-	-	-
<i>Loimia</i> sp.		-	-	-	-
<i>Pista cristata</i>		-	-	-	-
Terebellidae (LPIL)		-	-	-	-
<b>Order: Capitellida</b>					
<b>Family: Capitellidae</b>					
<i>Capitella capitata</i> complex Blake		-	-	14	-
<i>Capitella jonesi</i>		-	-	-	-
<i>Capitella</i> sp.		-	-	-	-
Capitellidae (LPIL)		-	-	-	-
<i>Heteromastus filiformis</i>		-	-	-	-
<i>Mediomastus ambiseta</i>		-	86	86	57
<i>Mediomastus californiensis</i>		-	-	-	-
<i>Mediomastus</i> sp.		-	57	172	-
<b>Order: Orbiniida</b>					
<b>Family: Orbiniidae</b>					
<i>Leitoscoloplos fragilis</i>		-	-	-	-
<i>Leitoscoloplos</i> sp.		-	-	-	-
Orbiniidae (LPIL)		-	-	-	-
<i>Scoloplos rubra</i>		-	-	-	-
<b>Order: Phyllodocida</b>					
<b>Family: Pilargidae</b>					
<i>Sigambra tentaculata</i>		-	14	-	-
<b>Order: Unspecified</b>					
<b>Family: Maldanidae</b>					
<i>Clymenella torquata</i>		-	-	-	-
<b>Class: Clitellata</b>					
<b>Order: Haplotaxida</b>					
<b>Family: Naididae</b>					
<i>Paranais frici</i>		-	-	-	-
<b>Family: Tubificoid Naididae</b>					
Tubificoid Naididae imm. w/o hair setae (LPIL)		-	14	-	-
<i>Tubificoides</i> sp.		-	-	-	-
<b>Phylum: Arthropoda</b>					
<b>Class: Malacostraca</b>					
<b>Order: Amphipoda</b>					
<b>Family: Aoridae</b>					
Aoridae (LPIL)		-	-	-	-



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

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**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

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Station Replicate Collection Date	LW03-SD558-03 LW03-SD558-03-10C 09/08/10	LW07-L2-SD401-02 LW07-L2- SD401-02-10C-02 09/11/10	LW07-L2-SD401-03 LW07-L2- SD401-03-10C-03 09/11/10	LW07-H1-SD401-02 LW07-H1- SD401-00-10C-02 09/10/10
<b>Family: Corophiidae</b>				
<i>Monocorophium acherusicum</i>	-	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-	-
<i>Monocorophium</i> sp.	-	-	-	-
<b>Family: Liljeborgiidae</b>				
<i>Listriella clymenellae</i>	-	-	-	-
<b>Order: Cumacea</b>				
<b>Family: Bodotriidae</b>				
<i>Cyclaspis varians</i>	-	-	-	-
<b>Family: Leuconidae</b>				
<i>Leucon americanus</i>	-	-	14	-
<b>Family: Unspecified</b>				
Cumacea (LPIL)	-	-	-	-
<b>Order: Decapoda</b>				
<b>Family: Alpheidae</b>				
<i>Alpheus</i> sp.	-	-	-	-
<b>Family: Palaemonidae</b>				
<i>Palaemonetes</i> sp.	-	-	-	-
<b>Family: Panopeidae</b>				
Panopeidae (LPIL)	-	-	-	-
<i>Panopeus herbstii</i>	-	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-	-
<b>Family: Pinnotheridae</b>				
<i>Pinnixa</i> sp.	-	-	-	-
<b>Family: Portunidae</b>				
<i>Callinectes</i> sp.	-	-	-	-
Portunidae (LPIL)	-	-	-	-
<b>Family: Unspecified</b>				
Decapoda (LPIL)	-	-	-	-
Decapoda (zoea)	-	-	-	-
Decapoda zoea (larva)	-	-	-	-
<b>Order: Isopoda</b>				
<b>Family: Idoteidae</b>				
<i>Edotia triloba</i>	-	-	-	-
<b>Order: Leptostraca</b>				
<b>Family: Unspecified</b>				
Leptostraca (LPIL)	-	-	-	-
<b>Order: Mysida</b>				
<b>Family: Mysidae</b>				
<i>Americamysis bigelowi</i>	-	-	14	-
<i>Americamysis</i> sp.	-	-	-	-
Mysidae (LPIL)	-	-	-	-
<i>Neomysis americana</i>	-	-	-	-
<b>Family: Unspecified</b>				
Mysidacea (LPIL)	-	-	-	-
<b>Order: Stomatopoda</b>				
<b>Family: Squillidae</b>				



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**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

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Station Replicate Collection Date	LW03-SD558-03 LW03-SD558-03-10C 09/09/10	LW07-L2-SD401-02 LW07-L2- SD401-02-10C-02 09/11/10	LW07-L2-SD401-03 LW07-L2- SD401-03-10C-03 09/11/10	LW07-H1-SD401-02 LW07-H1- SD401-00-10C-02 09/10/10
<i>Squilla empusa</i>	-	-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>	-	-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)	-	-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)	-	-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)	-	-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>	-	-	14	14
<i>Acteocina</i> sp.	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>	-	-	-	-
<b>Order: Heterostropha</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>	-	-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>	-	-	-	-
<i>Nassarius vibex</i>	-	-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>	-	-	-	-
<i>Crepidula plana</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>	-	-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>	-	-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)	-	-	-	-
<b>Class: Bivalvia</b>				



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2010

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<b>Order: Arcoida</b>				
<b>Family: Arcidae</b>				
<i>Anadara transversa</i>	-	-	-	-
<b>Order: Mytiloida</b>				
<b>Family: Mytilidae</b>				
<i>Amygdalum papyrium</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Anomia simplex</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Anomiidae</b>				
<i>Pododesmus rudis</i>	-	-	-	-
<b>Order: Ostreoida</b>				
<b>Family: Ostreidae</b>				
<i>Crassostrea virginica</i>	-	-	-	-
<b>Order: Pholadomyoida</b>				
<b>Family: Lyonsiidae</b>				
<i>Lyonsia hyalina</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Mactridae</b>				
Mactridae (LPIL)	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<i>Mulinia lateralis</i>	-	-	-	-
<b>Family: Petricolidae</b>				
<i>Petricolaria pholadiformis</i>	-	-	-	-
<b>Family: Solecurtidae</b>				
<i>Tagelus plebeius</i>	-	-	-	-
<i>Tagelus</i> sp.	-	-	-	-
<b>Family: Tellinidae</b>				
<i>Macoma tenta</i>	-	-	14	-
Tellinidae (LPIL)	-	-	-	-
<b>Family: Veneridae</b>				
<i>Gemma gemma</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Mercenaria mercenaria</i>	-	-	-	-
<b>Order: Veneroida</b>				
<b>Family: Veneridae</b>				
<i>Pitar</i> sp.	-	-	14	-
Veneridae (LPIL)	-	-	14	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Bivalvia</i> (LPIL)	-	14	-	-
<b>Phylum: Phoronida</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				





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**Prepared For:** CH2M HILL  
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2010

**Sample Method:** Petite Ponar (x3)  
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#### Taxonomic Classification

	Station Replicate Collection Date	LW03-SD558-03 LW03-SD558-03-10C 09/08/10	LW07-L2-SD401-02 LW07-L2- SD401-02-10C-02 09/11/10	LW07-L2-SD401-03 LW07-L2- SD401-03-10C-03 09/11/10	LW07-H1-SD401-02 LW07-H1- SD401-00-10C-02 09/10/10
Phoronida (LPIL)		-	14	14	-
<b>Phylum: Echinodermata</b>					
<b>Class: Ophiuroidea</b>					
<b>Order: Unspecified</b>					
<b>Family: Unspecified</b>					
Ophiuroidea (LPIL)		-	-	-	-
<b>Phylum: Chordata</b>					
<b>Class: Cephalochordata</b>					
<b>Order: Amphioxiformes</b>					
<b>Family: Branchiostomatidae</b>					
<i>Branchiostoma</i> sp.		-	-	-	-
<b>No Organisms Present</b>		✓	-	-	-
<b>Total Organisms</b>		14	517	1020	273
<b>Total Taxa</b>		NA	11	15	4



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	Station Replicate Collection Date	LW07-H1-SD401-03 LW07-H1-SD401-00-10C-03 09/10/10	LW07-SD403-02 LW07-SD403-00-10C-02 09/11/10	LW07-SD403-03 LW07-SD403-00-10C-03 09/11/10
<b>Phylum: Porifera</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Porifera (LPIL)		-	-	-
<b>Phylum: Cnidaria</b>				
<b>Class: Hydrozoa</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Hydrozoa (LPIL)		-	-	-
<b>Class: Anthozoa</b>				
<b>Order: Actiniaria</b>				
<b>Family: Unspecified</b>				
Actiniaria (LPIL)		-	-	-
Actiniaria sp. A		-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Anthozoa (LPIL)		-	-	-
<b>Phylum: Nemertea</b>				
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
Nemertea (LPIL)		-	-	-
Nemertea sp. A (LPIL)		-	-	-
Nemertea sp. B (LPIL)		-	-	-
Nemertea sp. C (LPIL)		-	-	-
Nemertea sp. D (LPIL)		-	-	-
<b>Phylum: Annelida</b>				
<b>Class: Polychaeta</b>				
<b>Order: Aciculata</b>				
<b>Family: Dorvilleidae</b>				
Dorvillea ( <i>Schistomeringos</i> ) <i>rudolphi</i>		-	-	-
Dorvilleidae (LPIL)		-	-	-
<b>Family: Eunicidae</b>				
Marphysa <i>sanguinea</i>		-	-	-
<b>Family: Glyceridae</b>				
Glycera <i>americana</i>		-	-	-
Glycera <i>dibranchiata</i>		-	-	-
Glycera sp.		-	-	-
Ophioglycera sp.		-	-	-
<b>Family: Goniadidae</b>				
Glycinde <i>solitaria</i>		-	-	-
<b>Family: Hesionidae</b>				
Gyptis <i>crypta</i>		14	-	-
Hesionidae (LPIL)		-	-	-
Podarke <i>obscura</i>		-	-	-
<b>Family: Nereididae</b>				



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<i>Laonereis culveri</i>	-	-	-
<i>Neanthes succinea</i>	-	-	-
Nereididae (LPIL)	-	-	-
<i>Platynereis dumerillii</i>	-	-	-
<b>Family: Oeonidae</b>			
<i>Drilonereis longa</i>	-	-	-
<b>Family: Onuphidae</b>			
<i>Diopatra cuprea</i>	-	-	-
<b>Family: Phyllodocidae</b>			
<i>Eteone</i> sp.	-	-	-
<i>Eumida sanguinea</i>	-	-	-
<i>Phyllodoce mucosa</i>	-	-	-
Phyllodocidae (LPIL)	-	-	-
<b>Family: Polynoidae</b>			
<i>Lepidonotus</i> sp.	-	-	-
<b>Family: Syllidae</b>			
<i>Grubeosyllis clavata</i>	-	-	-
Syllidae (LPIL)	-	-	-
<b>Order: Canalipalpata</b>			
<b>Family: Ampharetidae</b>			
Ampharetidae (LPIL)	-	-	-
<b>Family: Chaetopteridae</b>			
<i>Spiochaetopterus costarum</i>	-	-	-
<b>Family: Cirratulidae</b>			
<i>Aphelocheata</i> sp.	-	-	-
Cirratulidae (LPIL)	-	-	-
<i>Tharyx</i> sp.	-	14	115
<b>Family: Pectinariidae</b>			
<i>Pectinaria gouldii</i>	-	-	14
<i>Pectinaria</i> sp.	-	-	-
<b>Family: Sabellidae</b>			
<i>Demonax microphthalmus</i>	-	-	-
<i>Sabellaria vulgaris</i>	-	-	-
Sabellidae (LPIL)	-	-	-
Sabellinae (LPIL)	-	-	-
<b>Family: Serpulidae</b>			
<i>Hydroides dianthus</i>	-	-	-
<b>Family: Serpulidae</b>			
<i>Hydroides diathus</i>	-	-	-
<b>Family: Serpulidae</b>			
<i>Hydroides</i> sp.	-	-	-
Serpulidae (LPIL)	-	-	-
<b>Family: Spionidae</b>			
<i>Apoprionospio pygmaea</i>	-	-	-
<i>Dipolydora cauleri</i>	-	-	-
<i>Dipolydora socialis</i>	-	-	-
<i>Marenzelleria viridis</i>	-	-	-



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<i>Minuspio</i> sp.	-	-	-
<i>Paraprionospio pinnata</i>	29	14	-
<i>Polydora cornuta</i>	14	-	-
<i>Pseudopolydora</i> sp.	-	-	-
<i>Scolecopsis texana</i>	-	-	-
<i>Spio</i> sp.	-	-	-
Spionidae (LPIL)	-	-	-
<i>Streblospio benedicti</i>	287	57	402
<b>Family: Terebellidae</b>			
<i>Loimia medusa</i>	-	-	-
<i>Loimia</i> sp.	-	-	-
<i>Pista cristata</i>	-	-	-
Terebellidae (LPIL)	-	-	-
<b>Order: Capitellida</b>			
<b>Family: Capitellidae</b>			
<i>Capitella capitata</i> complex Blake	43	14	-
<i>Capitella jonesi</i>	-	-	-
<i>Capitella</i> sp.	-	-	-
Capitellidae (LPIL)	-	-	-
<i>Heteromastus filiformis</i>	-	-	-
<i>Mediomastus ambiseta</i>	14	14	172
<i>Mediomastus californiensis</i>	-	-	-
<i>Mediomastus</i> sp.	-	-	43
<b>Order: Orbiniida</b>			
<b>Family: Orbiniidae</b>			
<i>Leitoscoloplos fragilis</i>	-	-	-
<i>Leitoscoloplos</i> sp.	-	-	-
Orbiniidae (LPIL)	-	-	-
<i>Scoloplos rubra</i>	-	-	-
<b>Order: Phyllodocida</b>			
<b>Family: Pilargidae</b>			
<i>Sigambra tentaculata</i>	14	-	-
<b>Order: Unspecified</b>			
<b>Family: Maldanidae</b>			
<i>Clymenella torquata</i>	-	-	-
<b>Class: Clitellata</b>			
<b>Order: Haplotaenidia</b>			
<b>Family: Naididae</b>			
<i>Paranais frici</i>	-	-	-
<b>Family: Tubificoid Naididae</b>			
Tubificoid Naididae imm. w/o hair setae (LPIL)	14	14	29
<i>Tubificoides</i> sp.	-	-	-
<b>Phylum: Arthropoda</b>			
<b>Class: Malacostraca</b>			
<b>Order: Amphipoda</b>			
<b>Family: Aoridae</b>			
Aoridae (LPIL)	-	-	-



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## Macroinvertebrate Results Data Per Square Meter (Unpooled)

**Prepared For:** CH2M HILL  
**Project:** Navy Clean III  
**Sample Group:** Navy Clean Aug-Sept  
2010

**Sample Method:** Petite Ponar (x3)  
**Report Date:** 11/08/2010

### Taxonomic Classification

Station Replicate Collection Date	LW07-H1-SD401-03 LW07-H1-SD401-00-10C-03 09/10/10	LW07-SD403-02 LW07-SD403-00-10C-02 09/11/10	LW07-SD403-03 LW07-SD403-00-10C-03 09/11/10
<b>Family: Corophiidae</b>			
<i>Monocorophium acherusicum</i>	-	-	-
<i>Monocorophium insidiosum</i>	-	-	-
<i>Monocorophium</i> sp.	-	-	14
<b>Family: Liljeborgiidae</b>			
<i>Listriella clymenellae</i>	-	-	-
<b>Order: Cumacea</b>			
<b>Family: Bodotriidae</b>			
<i>Cyclaspis varians</i>	-	-	-
<b>Family: Leuconidae</b>			
<i>Leucon americanus</i>	-	-	-
<b>Family: Unspecified</b>			
Cumacea (LPIL)	-	-	-
<b>Order: Decapoda</b>			
<b>Family: Alpheidae</b>			
<i>Alpheus</i> sp.	-	-	-
<b>Family: Palaemonidae</b>			
<i>Palaemonetes</i> sp.	-	-	-
<b>Family: Panopeidae</b>			
Panopeidae (LPIL)	-	-	-
<i>Panopeus herbstii</i>	-	-	-
<i>Rhithropanopeus harrisii</i>	-	-	-
<b>Family: Pinnotheridae</b>			
<i>Pinnixa</i> sp.	-	-	-
<b>Family: Portunidae</b>			
<i>Callinectes</i> sp.	-	-	-
Portunidae (LPIL)	-	-	-
<b>Family: Unspecified</b>			
Decapoda (LPIL)	-	-	-
Decapoda (zoea)	-	-	-
Decapoda zoea (larva)	-	-	-
<b>Order: Isopoda</b>			
<b>Family: Idoteidae</b>			
<i>Edotia triloba</i>	-	-	-
<b>Order: Leptostraca</b>			
<b>Family: Unspecified</b>			
Leptostraca (LPIL)	-	-	-
<b>Order: Mysida</b>			
<b>Family: Mysidae</b>			
<i>Americamysis bigelowi</i>	14	-	-
<i>Americamysis</i> sp.	-	-	-
Mysidae (LPIL)	-	-	-
<i>Neomysis americana</i>	-	-	-
<b>Family: Unspecified</b>			
Mysidacea (LPIL)	-	-	-
<b>Order: Stomatopoda</b>			
<b>Family: Squillidae</b>			



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<i>Squilla empusa</i>		-	-	-
<b>Class: Maxillopoda</b>				
<b>Order: Sessilia</b>				
<b>Family: Balanoidea</b>				
<i>Balanus improvisus</i>		-	-	-
<b>Family: Balanomorpha</b>				
<i>Balanomorpha</i> (LPIL)		-	-	-
<b>Class: Entognatha</b>				
<b>Order: Collembola</b>				
<b>Family: Unspecified</b>				
<i>Collembola</i> (LPIL)		-	-	-
<b>Class: Unspecified</b>				
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Crustacea</i> (LPIL)		-	-	-
<b>Phylum: Mollusca</b>				
<b>Class: Gastropoda</b>				
<b>Order: Cephalaspidea</b>				
<b>Family: Cylichnidae</b>				
<i>Acteocina canaliculata</i>		14	29	-
<i>Acteocina</i> sp.		-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Odostomia engonia</i>		-	-	-
<b>Order: Heterostrophia</b>				
<b>Family: Pyramidellidae</b>				
<i>Turbonilla interrupta</i>		-	-	-
<b>Order: Neogastropoda</b>				
<b>Family: Columbellidae</b>				
<i>Astyris lunata</i>		-	-	-
<i>Nassarius vibex</i>		-	-	-
<b>Family: Conidae</b>				
<i>Pyrgocythara plicosa</i>		-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Calyptraeidae</b>				
<i>Crepidula fornicata</i>		-	-	-
<i>Crepidula plana</i>		-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Cerithiopsidae</b>				
<i>Cerithiopsis greenii</i>		-	-	-
<b>Order: Neotaenioglossa</b>				
<b>Family: Epitoniidae</b>				
<i>Epitonium rupicola</i>		-	-	-
<b>Order: Unspecified</b>				
<b>Family: Unspecified</b>				
<i>Gastropoda</i> (LPIL)		-	-	-
<b>Class: Bivalvia</b>				



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<b>Order: Arcoida</b>			
<b>Family: Arcidae</b>			
<i>Anadara transversa</i>	-	-	-
<b>Order: Mytiloida</b>			
<b>Family: Mytilidae</b>			
<i>Amygdalum papyrium</i>	-	-	-
<b>Order: Ostreoida</b>			
<b>Family: Anomiidae</b>			
<i>Anomia simplex</i>	-	-	-
<b>Order: Ostreoida</b>			
<b>Family: Anomiidae</b>			
<i>Pododesmus rudis</i>	-	-	-
<b>Order: Ostreoida</b>			
<b>Family: Ostreidae</b>			
<i>Crassostrea virginica</i>	-	-	-
<b>Order: Pholadomyoida</b>			
<b>Family: Lyonsiidae</b>			
<i>Lyonsia hyalina</i>	-	-	-
<b>Order: Veneroida</b>			
<b>Family: Mactridae</b>			
Mactridae (LPIL)	-	14	14
<i>Mulinia lateralis</i>	-	-	-
<i>Mulinia lateralis</i>	-	-	-
<b>Family: Petricolidae</b>			
<i>Petricolaria pholadiformis</i>	-	-	-
<b>Family: Solecurtidae</b>			
<i>Tagelus plebeius</i>	-	-	-
<i>Tagelus</i> sp.	-	-	-
<b>Family: Tellinidae</b>			
<i>Macoma tenta</i>	-	-	-
Tellinidae (LPIL)	-	-	-
<b>Family: Veneridae</b>			
<i>Gemma gemma</i>	-	-	-
<b>Order: Veneroida</b>			
<b>Family: Veneridae</b>			
<i>Mercenaria mercenaria</i>	-	-	-
<b>Order: Veneroida</b>			
<b>Family: Veneridae</b>			
<i>Pitar</i> sp.	-	-	-
Veneridae (LPIL)	14	-	14
<b>Order: Unspecified</b>			
<b>Family: Unspecified</b>			
<i>Bivalvia</i> (LPIL)	-	-	-
<b>Phylum: Phoronida</b>			
<b>Class: Unspecified</b>			
<b>Order: Unspecified</b>			
<b>Family: Unspecified</b>			



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Phoronida (LPIL)	-	-	-
<b>Phylum: Echinodermata</b>			
<b>Class: Ophiuroidea</b>			
<b>Order: Unspecified</b>			
<b>Family: Unspecified</b>			
Ophiuroidea (LPIL)	-	-	-
<b>Phylum: Chordata</b>			
<b>Class: Cephalochordata</b>			
<b>Order: Amphioxiformes</b>			
<b>Family: Branchiostomatidae</b>			
<i>Branchiostoma</i> sp.	-	-	-
<b>No Organisms Present</b>	-	-	-
<b>Total Organisms</b>	474	172	819
<b>Total Taxa</b>	11	8	9



## **Appendix C**

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Raw Data Species Pollution Sensitivity Classifications, and  
Various Metrics

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD501	LW03-SD502	LW03-SD503	LW03-SD504A	LW03-SD504
					LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504A-00-10C	LW03-SD504-00-10C
					09/02/2010	09/02/2010	09/02/2010	08/31/2010	08/30/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	1	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		2	0	1	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		1	0	0	0	0
			Glycinde solitaria	PS, OP	2	1	0	1	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		1	0	0	1	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		6	1	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		1	0	0	0	0
			Spiochaetopterus costarum	PS	2	2	0	2	0
			Aphelochaeta sp.		0	5	1	0	0
			Cirratulidae (LPIL)		1	0	0	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	4	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	1	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	1	0
			Serpulidae (LPIL)		0	1	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	0	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	3	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	1	0	1	2	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	1	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	2	0	0	0
			Capitella capitata complex Blake	PI, OP	7	0	3	1	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	1	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	2	0	0	1
			Mediomastus ambiseta	PS, PI, OP	5	0	2	4	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		1	4	1	1	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD501	LW03-SD502	LW03-SD503	LW03-SD504A	LW03-SD504
					LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504A-00-10C	LW03-SD504-00-10C
					09/02/2010	09/02/2010	09/02/2010	08/31/2010	08/30/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisii		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		1	2	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	1	0	0	0	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	1	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	1	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	1	0	0	0
			Crepidula fornicata		8	5	0	0	0
			Crepidula plana		2	0	0	0	0
			Cerithiopsis greenii		0	1	0	0	0
			Epitonium rupicola		0	1	0	0	0
			Gastropoda (LPIL)		0	1	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		1	0	1	0	0
			Anomia simplex		0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	1	2	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		2	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	6	5	2	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	2
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		1	3	3	0	0
			Bivalvia (LPIL)		0	0	0	0	0
Phoronida									
			Phoronida (LPIL)		7	6	3	0	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		60	53	23	13	3
			Number of Taxa		22	23	13	8	2
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
					Total Raw Count	60	53	23	3
					Total Density (Number per Square Meter)	862	761	330	43
					Number of Taxa	22	23	13	2
					Shannon Diversity Index (Base e)	2.755	2.91	2.442	0.637
					Shannon Diversity Index (Base 2)	3.975	4.198	3.523	0.918
					Name of Dominant Taxon	Crepidula fornicata	Phoronida (LPIL)	Capitella capitata complex Blake	Mediomastus ambiseta
					Percent Contribution of Dominant Taxon	13.33	11.32	13.04	66.67
					Density (No./Square Meter) Dominant Taxon	115	86	43	29
					Percent Amphipods	0.00	0.00	0.00	0.00
					Percent Bivalves	18.40	18.90	26.00	66.70
					Percent Spionid Polychaetes	1.70	0.00	17.40	0.00
					Percent Mediomastus Polychaetes	10.00	7.55	13.05	0.00
					Percent Deposit Feeders	32.5	17.93	30.44	33.33

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD505	LW03-SD506	LW03-SD507	LW03-SD508	LW03-SD509
					LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD507-00-10C	LW03-SD508-00-10C	LW03-SD509-00-10C
					08/31/2010	09/10/2010	09/02/2010	09/10/2010	09/09/2010
Porifera									
			Porifera (LPIL)		1	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	2	2	0	1
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	3	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	1	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	1	1	1	0
			Gyptis crypta		0	2	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	1	0	0	1
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	1	2
			Nereididae (LPIL)		0	1	1	0	0
			Platynereis dumerilii		0	0	0	0	1
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	1	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	1	4	1	1	0
			Aphelochaeta sp.		0	0	5	0	0
			Cirratulidae (LPIL)		0	7	0	0	0
			Tharyx sp.		0	3	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	1	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	3	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	1
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	4	1	0	0	0
			Polydora cornuta	PI, OP	0	0	0	2	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	1	0	2	9	1
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	1	2	0	14	11
			Capitella jonesi	PI, OP	0	0	0	1	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	1	0
			Mediomastus ambiseta	PS, PI, OP	1	5	3	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	6	1	1	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD505	LW03-SD506	LW03-SD507	LW03-SD508	LW03-SD509
					LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD507-00-10C	LW03-SD508-00-10C	LW03-SD509-00-10C
					08/31/2010	09/10/2010	09/02/2010	09/10/2010	09/09/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	1	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	1	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	4
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	0	1	0	0	0
			Acteocina sp.		0	0	1	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	1	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	1	0	1
			Pyrgocythara plicosa		0	4	0	0	0
			Crepidula fornicata		0	17	0	0	3
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	1	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	1	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	0	1
			Pododesmus rudis		0	0	0	0	1
			Crassostrea virginica		0	0	0	0	1
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	2	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	1	4	2	1	60
			Mercenaria mercenaria	PS, EQ	0	0	0	2	1
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		1	12	0	0	1
			Bivalvia (LPIL)		0	0	3	0	1
Phoronida									
			Phoronida (LPIL)		8	26	12	3	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	2	0	1
			Total Raw Count		19	107	43	39	93
			Number of Taxa		9	24	18	13	18
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
					19	107	43	39	93
Total Raw Count					273	1537	618	560	1336
Total Density (Number per Square Meter)					9	24	18	13	18
Number of Taxa					1.777	2.593	2.522	2.018	1.497
Shannon Diversity Index (Base e)					2.564	3.741	3.638	2.911	2.16
Shannon Diversity Index (Base 2)									
Name of Dominant Taxon					Phoronida (LPIL)	Phoronida (LPIL)	Phoronida (LPIL)	Streblospio benedicti	Gemma gemma
Percent Contribution of Dominant Taxon					42.11	24.30	27.91	23.08	64.52
Density (No./Square Meter) Dominant Taxon					115	374	172	129	862
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					0.00	0.00	0.00	7.70	67.80
Percent Spionid Polychaetes					26.30	0.90	4.70	28.20	2.20
Percent Mediomastus Polychaetes					5.26	10.28	9.31	2.56	0.00
Percent Deposit Feeders					26.32	25.23	13.95	60.26	15.06

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD510	LW03-SD511	LW03-SD512	LW03-SD513	LW03-SD514
					LW03-SD510-00-10C	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C
					08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/10/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	1	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	2	1	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	1
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	1	0
			Nereididae (LPIL)		0	0	1	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	1	5	0	0	2
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		1	1	0	0	0
			Tharyx sp.		2	0	0	0	0
			Pectinaria gouldii		0	1	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		1	0	0	0	0
			Sabellinae (LPIL)		0	0	1	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	1
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	8	10	4	0	0
			Polydora cornuta	PI, OP	0	2	0	1	0
			Pseudopolydora sp.		0	0	1	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	5	0	1	0	4
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		1	0	0	3	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	15	5
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	2	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD510	LW03-SD511	LW03-SD512	LW03-SD513	LW03-SD514	
					LW03-SD510-00-10C	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C	
					08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/10/2010	
Arthropoda										
	Malacostraca									
		Amphipoda								
			Aoridae (LPIL)		0	0	0	0	0	
			Monocorophium acherusicum		0	0	0	0	0	
			Monocorophium insidiosum		0	0	0	0	0	
			Monocorophium sp.		0	0	0	0	0	
			Listriella clymenellae	PS	0	0	0	0	0	
		Cumacea								
			Cyclaspis varians		0	0	0	0	0	
			Leucon americanus		0	0	0	0	0	
			Cumacea (LPIL)		0	0	0	0	0	
		Decapoda								
			Alpheus sp.	PS, EQ?	0	0	0	0	0	
			Palaemonetes sp.		0	0	0	0	0	
			Panopeidae (LPIL)		0	0	0	0	0	
			Panopeus herbstii		0	0	0	0	0	
			Rhithropanopeus harrisii		0	0	0	0	0	
			Pinnixa sp.		0	0	0	0	0	
			Callinectes sp.		0	0	0	0	0	
			Portunidae (LPIL)		0	0	0	0	0	
			Decapoda (LPIL)		0	0	0	0	0	
			Decapoda zoea (larva)		0	0	0	0	0	
		Isopoda								
			Edotia triloba		0	0	0	0	0	
		Leptostraca								
			Leptostraca (LPIL)		0	0	0	0	0	
		Mysida								
			Americamysis bigelowi		0	0	0	0	0	
			Americamysis sp.		0	0	0	0	0	
			Mysidae (LPIL)		0	0	0	0	0	
			Neomysis americana		0	0	0	0	0	
			Mysidacea (LPIL)		0	0	0	0	0	
		Stomatopoda								
			Squilla empusa	PS, EQ	0	0	0	0	0	
		Maxillopoda								
		Sessilia								
			Balanus improvisus		0	0	0	0	0	
			Balanomorpha (LPIL)		0	0	0	0	0	
		Entognatha								
			Collembola (LPIL)		0	0	0	0	0	
		Unspecified								
			Crustacea (LPIL)		0	0	0	0	0	
Mollusca										
		Gastropoda								
			Acteocina canaliculata	PS	0	7	0	0	0	
			Acteocina sp.		0	0	0	0	0	
			Odostomia engonia		0	1	0	0	0	
			Turbonilla interrupta		0	0	0	0	0	
			Astyris lunata		0	0	0	0	0	
			Nassarius vibex		0	0	0	0	0	
			Pyrgocythara plicosa		0	0	0	0	0	
			Crepidula fornicata		0	0	0	0	0	
			Crepidula plana		0	0	0	0	0	
			Cerithiopsis greenii		0	0	0	0	0	
			Epitonium rupicola		0	0	0	0	0	
			Gastropoda (LPIL)		0	2	0	0	0	
		Bivalvia								
			Anadara transversa	PS, EQ	0	0	0	0	0	
			Amygdalum papyrium		0	0	0	0	0	
			Anomia simplex		0	0	0	0	0	
			Pododesmus rudis		0	0	0	0	0	
			Crassostrea virginica		0	0	0	0	0	
			Lyonsia hyalina		0	0	0	0	0	
			Mactridae (LPIL)		0	0	0	0	0	
			Mulinia lateralis	OP	0	0	0	0	0	
			Petricolaria pholadiformis		0	0	0	0	0	
			Tagelus plebeius	EQ	0	0	0	0	0	
			Tagelus sp.	PS, EQ?	0	0	0	0	0	
			Macoma tenta		0	2	0	0	0	
			Tellinidae (LPIL)		0	0	0	0	0	
			Gemma gemma	OP	0	0	0	0	0	
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	
			Pitar sp.		0	0	0	0	0	
			Veneridae (LPIL)		2	5	0	0	0	
			Bivalvia (LPIL)		0	0	0	0	0	
Phoronida										
			Phoronida (LPIL)		4	20	0	1	0	
Echinodermata										
			Ophiuroidea (LPIL)		0	0	0	0	0	
Chordata										
			Branchiostoma sp.		0	0	0	0	0	
			Total Raw Count		27	59	9	21	13	
			Number of Taxa		10	13	6	5	5	
			PS = Pollution Sensitive, Weisberg et al, 1997							
			PI = Polution Indicator, Weisberg et al. 1997							
			OP = Opportunistic, Ranasinghe et al. 1994							
			EQ = Equilibrium, Ranasinghe et al. 1994							
			? = Uncertanty due to taxonomic identification level							
Metrics										
					Total Raw Count	27	59	9	21	13
					Total Density (Number per Square Meter)	388	848	129	302	187
					Number of Taxa	10	13	6	5	5
					Shannon Diversity Index (Base e)	2.022	2.074	1.581	0.953	1.413
					Shannon Diversity Index (Base 2)	2.917	2.992	2.281	1.375	2.038
					Name of Dominant Taxon	Paraprionospio pinnata	Phoronida (LPIL)	Paraprionospio pinnata	Capitella capitata complex Blake	Capitella capitata complex Blake
					Percent Contribution of Dominant Taxon	29.63	33.90	44.44	71.43	38.46
					Density (No./Square Meter) Dominant Taxon	115	287	57	216	72
					Percent Amphipods	0.00	0.00	0.00	0.00	0.00
					Percent Bivalves	7.40	11.90	0.00	0.00	0.00
					Percent Spionid Polychaetes	48.10	20.30	66.70	4.80	30.80
					Percent Mediomastus Polychaetes	7.41	0.00	0.00	0.00	0.00
					Percent Deposit Feeders	46.3	17.79	38.89	83.33	61.54

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD515	LW03-SD516	LW03-SD517	LW03-SD518	LW03-SD519
					LW03-SD515-00-10C	LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C
					09/09/2010	09/09/2010	08/31/2010	08/31/2010	09/02/2010
Porifera									
			Porifera (LPIL)		0	0	1	1	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		2	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	3	5	0	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		1	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	1	0	0	0
			Platynereis dumerilii		1	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	1
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	1	0	0	0	2
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		1	0	0	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	1	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	2	0	0	0	3
			Polydora cornuta	PI, OP	1	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	2
			Scoleclepis texana		0	1	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	5	1	0	0	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	2	2	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	1	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	1	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	1	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0



Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD515	LW03-SD516	LW03-SD517	LW03-SD518	LW03-SD519	
					LW03-SD515-00-10C	LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C	
					09/09/2010	09/09/2010	08/31/2010	08/31/2010	09/02/2010	
Arthropoda										
	Malacostraca									
		Amphipoda								
			Aoridae (LPIL)		1	0	0	0	0	
			Monocorophium acherusicum		0	0	0	0	0	
			Monocorophium insidiosum		0	0	0	0	0	
			Monocorophium sp.		0	0	0	0	0	
			Listriella clymenellae	PS	0	0	0	0	0	
		Cumacea								
			Cyclaspis varians		0	0	0	0	0	
			Leucon americanus		0	0	0	0	0	
			Cumacea (LPIL)		0	0	0	0	0	
		Decapoda								
			Alpheus sp.	PS, EQ?	0	0	0	0	0	
			Palaemonetes sp.		0	0	0	0	0	
			Panopeidae (LPIL)		0	0	0	0	0	
			Panopeus herbstii		0	0	0	0	0	
			Rhithropanopeus harrisii		0	0	0	0	0	
			Pinnixa sp.		0	0	0	0	0	
			Callinectes sp.		0	0	0	0	0	
			Portunidae (LPIL)		0	1	0	0	0	
			Decapoda (LPIL)		0	0	0	2	0	
			Decapoda zoea (larva)		0	0	0	0	0	
		Isopoda								
			Edotia triloba		0	0	0	0	0	
		Leptostraca								
			Leptostraca (LPIL)		0	0	0	0	0	
		Mysida								
			Americamysis bigelowi		0	0	0	0	0	
			Americamysis sp.		0	0	0	0	0	
			Mysidae (LPIL)		0	0	0	0	0	
			Neomysis americana		0	0	0	0	0	
			Mysidacea (LPIL)		0	0	0	0	0	
		Stomatopoda								
			Squilla empusa	PS, EQ	0	0	0	0	0	
		Maxillopoda								
		Sessilia								
			Balanus improvisus		0	0	0	0	0	
			Balanomorpha (LPIL)		0	0	0	0	0	
		Entognatha								
			Collembola (LPIL)		0	0	0	0	0	
		Unspecified								
			Crustacea (LPIL)		0	0	0	0	0	
Mollusca										
		Gastropoda								
			Acteocina canaliculata	PS	0	1	0	0	0	
			Acteocina sp.		0	0	0	0	0	
			Odostomia engonia		0	0	0	0	0	
			Turbonilla interrupta		0	0	0	0	0	
			Astyris lunata		0	0	0	0	0	
			Nassarius vibex		0	1	0	0	0	
			Pyrgocythara plicosa		0	0	0	0	0	
			Crepidula fornicata		0	0	0	0	0	
			Crepidula plana		0	0	0	0	0	
			Cerithiopsis greenii		0	0	0	0	0	
			Epitonium rupicola		0	0	0	0	0	
			Gastropoda (LPIL)		0	0	0	0	0	
		Bivalvia								
			Anadara transversa	PS, EQ	0	0	0	0	0	
			Amygdalum papyrium		0	0	0	0	0	
			Anomia simplex		0	0	0	0	0	
			Pododesmus rudis		0	0	0	0	0	
			Crassostrea virginica		0	0	0	0	0	
			Lyonsia hyalina		0	0	0	0	0	
			Mactridae (LPIL)		0	0	0	0	0	
			Mulinia lateralis	OP	0	0	0	0	0	
			Petricolaria pholadiformis		0	0	0	0	0	
			Tagelus plebeius	EQ	0	0	0	0	0	
			Tagelus sp.	PS, EQ?	0	0	0	0	0	
			Macoma tenta		0	0	0	0	0	
			Tellinidae (LPIL)		0	1	0	0	0	
			Gemma gemma	OP	0	17	1	0	0	
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	
			Pitar sp.		0	0	0	0	0	
			Veneridae (LPIL)		0	2	0	0	0	
			Bivalvia (LPIL)		1	0	0	0	0	
Phoronida										
			Phoronida (LPIL)		4	4	0	0	0	
Echinodermata										
			Ophiuroidea (LPIL)		0	0	0	0	0	
Chordata										
			Branchiostoma sp.		0	0	0	0	0	
			Total Raw Count		26	39	2	4	8	
			Number of Taxa		14	14	2	3	4	
			PS = Pollution Sensitive, Weisberg et al, 1997							
			PI = Polution Indicator, Weisberg et al. 1997							
			OP = Opportunistic, Ranasinghe et al. 1994							
			EQ = Equilibrium, Ranasinghe et al. 1994							
			? = Uncertanty due to taxonomic identification level							
Metrics										
					Total Raw Count	26	39	2	4	8
					Total Density (Number per Square Meter)	374	560	29	57	115
					Number of Taxa	14	14	2	3	4
					Shannon Diversity Index (Base e)	2.449	2.009	0.693	1.04	1.321
					Shannon Diversity Index (Base 2)	3.533	2.898	1	1.5	1.906
					Name of Dominant Taxon	Streblospio benedicti	Gemma gemma	Porifera (LPIL)/ Gemma gemma	Decapoda (LPIL)	Paraprionospio pinnata
					Percent Contribution of Dominant Taxon	19.23	43.59	50.00	50.00	37.50
					Density (No./Square Meter) Dominant Taxon	72	244	14	29	43
					Percent Amphipods	3.80	0.00	0.00	0.00	0.00
					Percent Bivalves	3.80	0.00	0.00	0.00	0.00
					Percent Spionid Polychaetes	34.60	5.10	0.00	0.00	62.50
					Percent Mediomastus Polychaetes	0.00	2.56	0.00	0.00	0.00
					Percent Deposit Feeders	34.61	14.11	0	25	43.75

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD520	LW03-SD521	LW03-SD522	LW03-SD523	LW03-SD525
					LW03-SD520-00-10C	LW03-SD521-00-10C	LW03-SD522-00-10C	LW03-SD523-00-10C	LW03-SD525-00-10C
					09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010
Porifera									
			Porifera (LPIL)		0	1	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	1	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		3	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	1	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	3	4	0
			Gyptis crypta		4	0	0	1	0
			Hesionidae (LPIL)		4	1	0	0	0
			Podarke obscura		13	0	0	2	0
			Laeonereis culveri		0	0	0	2	0
			Neanthes succinea	PI, OP	1	1	0	1	0
			Nereididae (LPIL)		0	0	0	7	0
			Platynereis dumerilii		0	0	0	1	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	3	2	1	0	0
			Aphelochaeta sp.		0	0	0	1	0
			Cirratulidae (LPIL)		0	1	1	2	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	1	2	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	1	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	2	0	1	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	3	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		2	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	2	2	2	0
			Polydora cornuta	PI, OP	4	2	0	2	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		1	0	0	1	0
			Streblospio benedicti	PI, OP	14	4	14	0	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		5	2	0	0	0
			Terebellidae (LPIL)		0	0	2	0	0
			Capitella capitata complex Blake	PI, OP	7	15	1	47	0
			Capitella jonesi	PI, OP	2	1	2	3	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	1	0
			Mediomastus ambiseta	PS, PI, OP	7	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		3	0	1	5	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	1	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	1	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		25	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD520	LW03-SD521	LW03-SD522	LW03-SD523	LW03-SD525	
					LW03-SD520-00-10C	LW03-SD521-00-10C	LW03-SD522-00-10C	LW03-SD523-00-10C	LW03-SD525-00-10C	
					09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010	
Arthropoda										
	Malacostraca									
		Amphipoda								
		Aoridae (LPIL)			0	0	0	1	0	
		Monocorophium acherusicum			2	0	0	0	0	
		Monocorophium insidiosum			1	0	0	0	0	
		Monocorophium sp.			13	0	0	0	0	
		Listriella clymenellae	PS		0	0	1	0	0	
		Cumacea								
		Cyclaspis varians			0	0	0	0	0	
		Leucon americanus			0	0	0	0	0	
		Cumacea (LPIL)			0	0	0	0	0	
		Decapoda								
		Alpheus sp.	PS, EQ?		0	0	0	0	0	
		Palaemonetes sp.			0	0	0	1	0	
		Panopeidae (LPIL)			1	0	0	1	0	
		Panopeus herbstii			0	0	0	1	0	
		Rhithropanopeus harrisii			0	0	0	2	0	
		Pinnixa sp.			0	0	0	0	0	
		Callinectes sp.			0	0	0	1	0	
		Portunidae (LPIL)			0	0	0	0	0	
		Decapoda (LPIL)			0	0	0	0	0	
		Decapoda zoea (larva)			0	0	0	0	0	
		Isopoda								
		Edotia triloba			0	0	0	0	0	
		Leptostraca								
		Leptostraca (LPIL)			0	0	0	0	0	
		Mysida								
		Americamysis bigelowi			0	0	0	0	0	
		Americamysis sp.			0	0	0	0	0	
		Mysidae (LPIL)			0	0	0	0	0	
		Neomysis americana			0	0	0	0	0	
		Mysidacea (LPIL)			0	0	0	0	0	
		Stomatopoda								
		Squilla empusa	PS, EQ		0	0	0	0	0	
		Maxillopoda								
		Sessilia								
		Balanus improvisus			0	0	0	3	0	
		Balanomorpha (LPIL)			0	1	0	0	0	
		Entognatha								
		Collembola (LPIL)			0	1	0	0	0	
		Unspecified								
		Crustacea (LPIL)			0	0	0	0	0	
Mollusca										
		Gastropoda								
		Acteocina canaliculata	PS		0	0	0	0	0	
		Acteocina sp.			0	0	0	0	0	
		Odostomia engonia			0	0	0	0	0	
		Turbonilla interrupta			0	0	0	0	0	
		Astyris lunata			0	0	0	0	0	
		Nassarius vibex			0	0	0	0	0	
		Pyrgocythara plicosa			0	0	0	0	0	
		Crepidula fornicata			0	0	0	4	0	
		Crepidula plana			0	0	0	0	0	
		Cerithiopsis greenii			0	0	0	0	0	
		Epitonium rupicola			0	0	0	0	0	
		Gastropoda (LPIL)			0	0	0	0	0	
		Bivalvia								
		Anadara transversa	PS, EQ		0	0	0	0	0	
		Amygdalum papyrium			0	0	0	0	0	
		Anomia simplex			0	0	0	0	0	
		Pododesmus rudis			0	0	0	1	0	
		Crassostrea virginica			0	0	0	1	0	
		Lyonsia hyalina			0	0	0	0	0	
		Mactridae (LPIL)			0	0	0	0	0	
		Mulinia lateralis	OP		0	0	0	0	0	
		Petricolaria pholadiformis			0	0	0	0	0	
		Tagelus plebeius	EQ		0	0	0	0	0	
		Tagelus sp.	PS, EQ?		0	0	0	3	0	
		Macoma tenta			0	0	0	0	0	
		Tellinidae (LPIL)			0	0	0	0	0	
		Gemma gemma	OP		0	0	2	15	0	
		Mercenaria mercenaria	PS, EQ		0	0	0	0	0	
		Pitar sp.			0	0	0	0	0	
		Veneridae (LPIL)			0	1	1	4	0	
		Bivalvia (LPIL)			0	1	2	2	0	
Phoronida										
		Phoronida (LPIL)			0	0	17	9	0	
Echinodermata										
		Ophiuroidea (LPIL)			0	0	0	0	0	
Chordata										
		Branchiostoma sp.			0	0	0	0	0	
		Total Raw Count			115	40	53	138	0	
		Number of Taxa			20	18	17	35	0	
		PS = Pollution Sensitive, Weisberg et al, 1997								
		PI = Polution Indicator, Weisberg et al. 1997								
		OP = Opportunistic, Ranasinghe et al. 1994								
		EQ = Equilibrium, Ranasinghe et al. 1994								
		? = Uncertanty due to taxonomic identification level								
Metrics										
					Total Raw Count	115	40	53	138	0
					Total Density (Number per Square Meter)	1652	575	761	1983	0
					Number of Taxa	20	18	17	35	0
					Shannon Diversity Index (Base e)	2.57	2.361	2.171	2.725	0
					Shannon Diversity Index (Base 2)	3.708	3.407	3.133	3.931	0
					Name of Dominant Taxon	Tubificoides sp.	Capitella capitata complex Blake	Phoronida (LPIL)	Capitella capitata complex Blake	N/A
					Percent Contribution of Dominant Taxon	21.74	37.50	32.08	34.06	0
					Density (No./Square Meter) Dominant Taxon	359	216	244	675	0
					Percent Amphipods	13.90	0.00	1.90	0.70	0.00
					Percent Bivalves	0.00	5.00	9.50	18.10	0.00
					Percent Spionid Polychaetes	18.30	20.00	30.20	3.60	0.00
					Percent Mediomastus Polychaetes	8.70	0.00	1.89	3.62	0.00
					Percent Deposit Feeders	52.61	61.25	31.13	49.28	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD526	LW03-SD527	LW03-SD528	LW03-SD529	LW03-SD530
					LW03-SD526-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C
					09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010
Porifera									
			Porifera (LPIL)		1	1	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	1	0
	Anthozoa								
			Actiniaria (LPIL)		0	37	0	7	0
			Actiniaria sp. A		0	0	0	1	0
			Anthozoa (LPIL)		0	1	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	1	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	1	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	3	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	3	0	5	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	1	2	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	4	0
			Tharyx sp.		0	0	0	4	0
			Pectinaria gouldii		0	0	0	3	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	8	0	2	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	2	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	2	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	3	0	0
			Polydora cornuta	PI, OP	0	4	0	9	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	3	0	0	3	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	3	0
			Capitella capitata complex Blake	PI, OP	0	9	0	2	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	2	0
			Heteromastus filiformis	PI, OP	0	0	0	1	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	9	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	1	0
			Scoloplos rubra		0	0	0	2	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	1	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD526	LW03-SD527	LW03-SD528	LW03-SD529	LW03-SD530
					LW03-SD526-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C
					09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	1	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	0	0	0	2	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	1	0	5	0
			Crepidula plana		0	0	0	2	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	1	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	8	0
			Gemma gemma	OP	0	0	0	31	0
			Mercenaria mercenaria	PS, EQ	0	0	0	3	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		0	0	0	36	0
			Bivalvia (LPIL)		0	0	0	5	0
Phoronida									
			Phoronida (LPIL)		0	0	1	11	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		4	70	7	168	0
			Number of Taxa		2	12	4	30	0
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
Total Raw Count					4	70	7	168	0
Total Density (Number per Square Meter)					57	1006	101	2414	0
Number of Taxa					2	12	4	30	0
Shannon Diversity Index (Base e)					0.562	1.654	1.277	2.793	0
Shannon Diversity Index (Base 2)					0.811	2.386	1.842	4.029	0
Name of Dominant Taxon					Streblospio benedicti	Actiniaria (LPIL)	Paraprionospio pinnata	Vereridae (LPIL)	N/A
Percent Contribution of Dominant Taxon					75.00	52.86	42.86	21.43	0
Density (No./Square Meter) Dominant Taxon					43	532	43	517	0
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					0.00	0.00	0.00	49.50	0.00
Percent Spionid Polychaetes					75.00	5.70	42.90	7.10	0.00
Percent Mediomastus Polychaetes					0.00	0.00	0.00	5.36	0.00
Percent Deposit Feeders					37.5	16.43	35.71	21.13	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD533	LW03-SD534-01	LW03-SD535	LW03-SD537	LW03-SD538
					LW03-SD533-00-10C	LW03-SD534-01-10C	LW03-SD535-00-10C	LW03-SD537-00-10C	LW03-SD538-00-10C
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010
Porifera									
			Porifera (LPIL)		0	0	1	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	2	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	1	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	19	0	0
			Gyptis crypta		0	0	8	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	10	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	1	0	0
			Phyllodocidae (LPIL)		0	0	1	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	1	0	0
			Tharyx sp.		0	0	1	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	5	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	5	0	0
			Hydroides sp.		0	0	1	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	3	0	0	0	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	4	0	1	1	0
			Loimia medusa	PS	0	0	4	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	1	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	3	0	0
			Mediomastus californiensis		0	0	1	0	0
			Mediomastus sp.		0	0	4	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	1	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD533	LW03-SD534-01	LW03-SD535	LW03-SD537	LW03-SD538	
					LW03-SD533-00-10C	LW03-SD534-01-10C	LW03-SD535-00-10C	LW03-SD537-00-10C	LW03-SD538-00-10C	
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	
Arthropoda										
	Malacostraca									
		Amphipoda								
			Aoridae (LPIL)		0	0	0	0	0	
			Monocorophium acherusicum		0	0	0	0	0	
			Monocorophium insidiosum		0	0	0	0	0	
			Monocorophium sp.		0	0	0	0	0	
			Listriella clymenellae	PS	0	0	0	0	0	
		Cumacea								
			Cyclaspis varians		0	0	0	0	0	
			Leucon americanus		0	0	0	0	0	
			Cumacea (LPIL)		0	0	0	0	0	
		Decapoda								
			Alpheus sp.	PS, EQ?	0	0	0	0	0	
			Palaemonetes sp.		0	0	0	0	0	
			Panopeidae (LPIL)		0	0	0	0	0	
			Panopeus herbstii		0	0	0	0	0	
			Rhithropanopeus harrisii		0	0	1	0	0	
			Pinnixa sp.		0	0	0	0	0	
			Callinectes sp.		0	0	0	0	0	
			Portunidae (LPIL)		0	0	0	0	0	
			Decapoda (LPIL)		0	0	0	0	0	
			Decapoda zoea (larva)		0	0	0	0	0	
		Isopoda								
			Edotia triloba		0	0	0	0	0	
		Leptostraca								
			Leptostraca (LPIL)		0	0	0	0	0	
		Mysida								
			Americamysis bigelowi		0	0	0	0	0	
			Americamysis sp.		0	0	0	0	0	
			Mysidae (LPIL)		0	0	0	0	0	
			Neomysis americana		0	0	0	0	0	
			Mysidacea (LPIL)		0	0	0	0	0	
		Stomatopoda								
			Squilla empusa	PS, EQ	0	0	0	0	0	
		Maxillopoda								
		Sessilia								
			Balanus improvisus		0	0	0	0	0	
			Balanomorpha (LPIL)		0	0	0	0	0	
		Entognatha								
			Collembola (LPIL)		0	0	0	0	0	
		Unspecified								
			Crustacea (LPIL)		0	0	0	0	0	
Mollusca										
		Gastropoda								
			Acteocina canaliculata	PS	0	0	1	0	0	
			Acteocina sp.		0	0	0	0	0	
			Odostomia engonia		0	0	0	0	0	
			Turbonilla interrupta		0	0	0	0	0	
			Astyris lunata		0	0	0	0	0	
			Nassarius vibex		0	0	0	0	0	
			Pyrgocythara plicosa		0	0	0	0	0	
			Crepidula fornicata		0	0	4	0	0	
			Crepidula plana		0	0	0	0	0	
			Cerithiopsis greenii		0	0	0	0	0	
			Epitonium rupicola		0	0	0	0	0	
			Gastropoda (LPIL)		0	0	0	0	0	
		Bivalvia								
			Anadara transversa	PS, EQ	0	0	1	0	0	
			Amygdalum papyrium		0	0	0	0	0	
			Anomia simplex		0	0	0	0	0	
			Pododesmus rudis		0	0	0	0	0	
			Crassostrea virginica		0	0	0	0	0	
			Lyonsia hyalina		0	0	0	0	0	
			Mactridae (LPIL)		0	0	0	0	0	
			Mulinia lateralis	OP	0	0	3	0	0	
			Petricolaria pholadiformis		0	0	0	0	0	
			Tagelus plebeius	EQ	0	0	0	0	0	
			Tagelus sp.	PS, EQ?	0	0	1	0	0	
			Macoma tenta		0	0	0	0	0	
			Tellinidae (LPIL)		0	0	0	0	0	
			Gemma gemma	OP	0	0	3	0	0	
			Mercenaria mercenaria	PS, EQ	0	0	2	0	0	
			Pitar sp.		0	0	0	0	0	
			Veneridae (LPIL)		0	0	12	0	0	
			Bivalvia (LPIL)		1	0	0	0	0	
Phoronida										
			Phoronida (LPIL)		2	0	11	0	0	
Echinodermata										
			Ophiuroidea (LPIL)		0	0	0	0	0	
Chordata										
			Branchiostoma sp.		0	0	0	0	0	
			Total Raw Count		10	0	110	1	0	
			Number of Taxa		4	0	30	1	0	
			PS = Pollution Sensitive, Weisberg et al, 1997							
			PI = Polution Indicator, Weisberg et al. 1997							
			OP = Opportunistic, Ranasinghe et al. 1994							
			EQ = Equilibrium, Ranasinghe et al. 1994							
			? = Uncertanty due to taxonomic identification level							
Metrics										
					Total Raw Count	10	0	110	1	0
					Total Density (Number per Square Meter)	144	0	1580	14	0
					Number of Taxa	4	0	30	1	0
					Shannon Diversity Index (Base e)	1.28	0	2.908	0	0
					Shannon Diversity Index (Base 2)	1.846	0	4.195	0	0
					Name of Dominant Taxon	Streblospio benedicti	N/A	Glycinda solitara	Streblospio benedicti	N/A
					Percent Contribution of Dominant Taxon	40.00	0	17.12	100.00	0
					Density (No./Square Meter) Dominant Taxon	57	0	271	14	0
					Percent Amphipods	0.00	0.00	0.00	0.00	0.00
					Percent Bivalves	10.00	0.00	33.30	0.00	0.00
					Percent Spionid Polychaetes	70.00	0.00	0.90	100.00	0.00
					Percent Mediomastus Polychaetes	0.00	0.00	0.00	0.00	0.00
					Percent Deposit Feeders	35	0	13.51	50	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD539	LW03-SD540	LW03-SD541	LW03-SD543	LW03-SD544
					LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD541-00-10C	LW03-SD543-00-10C	LW03-SD544-00-10C
					09/01/2010	09/01/2010	09/07/2010	09/01/2010	09/01/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0
			Tharyx sp.		0	0	2	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	1	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	1	0	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	0	0	0	0	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0



Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD539	LW03-SD540	LW03-SD541	LW03-SD543	LW03-SD544
					LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD541-00-10C	LW03-SD543-00-10C	LW03-SD544-00-10C
					09/01/2010	09/01/2010	09/07/2010	09/01/2010	09/01/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	0	1	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	1	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	1	0	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		0	0	0	0	0
			Bivalvia (LPIL)		0	0	0	0	0
Phoronida									
			Phoronida (LPIL)		0	0	2	0	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		0	0	9	0	0
			Number of Taxa		0	0	7	0	0
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
					Total Raw Count	0	0	9	0
					Total Density (Number per Square Meter)	0	0	129	0
					Number of Taxa	0	0	7	0
					Shannon Diversity Index (Base e)	0	0	1.889	0
					Shannon Diversity Index (Base 2)	0	0	2.725	0
					Name of Dominant Taxon	N/A	N/A	Phoronida (LPIL) / Tharyx sp.	N/A
					Percent Contribution of Dominant Taxon	0	0	22.22	0
					Density (No./Square Meter) Dominant Taxon	0	0	29	0
					Percent Amphipods	0.00	0.00	0.00	0.00
					Percent Bivalves	0.00	0.00	0.00	0.00
					Percent Spionid Polychaetes	0.00	0.00	11.10	0.00
					Percent Mediomastus Polychaetes	0.00	0.00	0.00	0.00
					Percent Deposit Feeders	0	0	27.78	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD545	LW03-SD546	LW03-SD547	LW03-SD548	LW03-SD549
					LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD548-00-10C	LW03-SD549-00-10C
					09/01/2010	09/01/2010	09/07/2010	09/09/2010	09/09/2010
Porifera									
			Porifera (LPIL)		0	0	0	1	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	2	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	1	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	0	0
			Polydora cornuta	PI, OP	0	0	1	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	0	0	1	0	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD545	LW03-SD546	LW03-SD547	LW03-SD548	LW03-SD549
					LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD548-00-10C	LW03-SD549-00-10C
					09/01/2010	09/01/2010	09/07/2010	09/09/2010	09/09/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisii		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	2
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	0	0	2	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		0	0	13	0	0
			Bivalvia (LPIL)		0	0	0	0	0
Phoronida									
			Phoronida (LPIL)		0	0	0	0	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		0	0	20	1	2
			Number of Taxa		0	0	6	1	1
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
Total Raw Count					0	0	20	1	2
Total Density (Number per Square Meter)					0	0	287	14	29
Number of Taxa					0	0	6	1	1
Shannon Diversity Index (Base e)					0	0	1.19	0	0
Shannon Diversity Index (Base 2)					0	0	1.717	0	0
Name of Dominant Taxon					N/A	N/A	Veneridae (LPIL)	Porifera (LPIL)	Decapoda zoea (LPIL)
Percent Contribution of Dominant Taxon					0	0	65.00	100.00	100.00
Density (No./Square Meter) Dominant Taxon					0	0	187	14	29
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					0.00	0.00	0.00	0.00	0.00
Percent Spionid Polychaetes					0.00	0.00	10.00	0.00	0.00
Percent Mediomastus Polychaetes					0.00	0.00	0.00	0.00	0.00
Percent Deposit Feeders					0	0	10	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD550-01	LW03-SD551	LW03-SD552	LW03-SD553	LW03-SD555
					LW03-SD550-01-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C
					09/08/2010	09/08/2010	09/07/2010	09/07/2010	09/09/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	1	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	1	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	1	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	1	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	1	0	1	1
			Polydora cornuta	PI, OP	0	1	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	0	1	0	0	12
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	1	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	1	0
			Capitella capitata complex Blake	PI, OP	0	0	0	1	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	1	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD550-01	LW03-SD551	LW03-SD552	LW03-SD553	LW03-SD555
					LW03-SD550-01-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C
					09/08/2010	09/08/2010	09/07/2010	09/07/2010	09/09/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	1	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	0	0	0	1	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	1	0
			Crepidula fornicata		0	0	0	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	1	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	1	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	0	0	0	1	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		0	0	0	4	0
			Bivalvia (LPIL)		0	0	0	0	0
Phoronida									
			Phoronida (LPIL)		0	0	0	1	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		0	3	0	20	13
			Number of Taxa		0	3	0	17	2
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
Total Raw Count					0	3	0	20	13
Total Density (Number per Square Meter)					0	43	0	287	187
Number of Taxa					0	3	0	17	2
Shannon Diversity Index (Base e)					0	1.099	0	2.776	0.271
Shannon Diversity Index (Base 2)					0	1.585	0	4.005	0.391
Name of Dominant Taxon					N/A	Paraprionospio pinnata / Polydora cornuta / Streblospio benedicti	N/A	Veneridae (LPIL)	Streblospio benedicti
Percent Contribution of Dominant Taxon					0	33.33	0	18.18	95.31
Density (No./Square Meter) Dominant Taxon					0	14	0	52	178
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					0.00	0.00	0.00	36.30	0.00
Percent Spionid Polychaetes					0.00	100.00	0.00	4.50	100.00
Percent Mediomastus Polychaetes					0.00	0.00	0.00	0.00	0.00
Percent Deposit Feeders					0	50	0	18.18	50

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD556	LW03-SD557	LW03-SD558-01	LW03-SD559	LW03-SD562
					LW03-SD556-00-10C	LW03-SD557-00-10C	LW03-SD558-01-10C	LW03-SD559-00-10C	LW03-SD562-00-10C
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/08/2010
Porifera									
			Porifera (LPIL)		0	0	0	1	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	1	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	1	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	3	0	1	1	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD556	LW03-SD557	LW03-SD558-01	LW03-SD559	LW03-SD562
					LW03-SD556-00-10C	LW03-SD557-00-10C	LW03-SD558-01-10C	LW03-SD559-00-10C	LW03-SD562-00-10C
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/08/2010
Arthropoda									
	Malacostraca								
		Amphipoda							
		Aoridae (LPIL)		0	0	0	0	0	
		Monocorophium acherusicum		0	0	0	0	0	
		Monocorophium insidiosum		0	0	0	0	0	
		Monocorophium sp.		0	0	0	0	0	
		Listriella clymenellae	PS	0	0	0	0	0	
		Cumacea							
		Cyclaspis varians		0	0	0	0	0	
		Leucon americanus		0	0	0	0	0	
		Cumacea (LPIL)		0	0	0	0	0	
		Decapoda							
		Alpheus sp.	PS, EQ?	0	0	0	0	0	
		Palaemonetes sp.		0	0	0	0	0	
		Panopeidae (LPIL)		0	0	0	0	0	
		Panopeus herbstii		0	0	0	0	0	
		Rhithropanopeus harrisii		0	0	0	0	0	
		Pinnixa sp.		0	0	0	1	0	
		Callinectes sp.		0	0	0	0	0	
		Portunidae (LPIL)		0	0	0	0	0	
		Decapoda (LPIL)		0	1	0	0	0	
		Decapoda zoea (larva)		2	1	0	0	0	
		Isopoda							
		Edotia triloba		0	0	0	0	0	
		Leptostraca							
		Leptostraca (LPIL)		0	0	0	0	1	
		Mysida							
		Americamysis bigelowi		0	0	0	0	0	
		Americamysis sp.		0	0	1	0	0	
		Mysidae (LPIL)		1	0	0	0	0	
		Neomysis americana		0	1	0	0	0	
		Mysidacea (LPIL)		0	0	0	0	0	
		Stomatopoda							
		Squilla empusa	PS, EQ	1	0	0	0	0	
		Maxillopoda							
		Sessilia							
		Balanus improvisus		0	0	0	0	0	
		Balanomorpha (LPIL)		0	0	0	0	0	
		Entognatha							
		Collembola (LPIL)		0	0	0	0	0	
		Unspecified							
		Crustacea (LPIL)		0	0	0	0	0	
Mollusca									
		Gastropoda							
		Acteocina canaliculata	PS	0	0	0	0	0	
		Acteocina sp.		0	0	0	0	0	
		Odostomia engonia		0	0	0	0	0	
		Turbonilla interrupta		0	0	0	0	0	
		Astyris lunata		0	0	0	0	0	
		Nassarius vibex		0	0	0	0	0	
		Pyrgocythara plicosa		0	0	0	0	0	
		Crepidula fornicata		0	0	0	0	0	
		Crepidula plana		0	0	0	0	0	
		Cerithiopsis greenii		0	0	0	0	0	
		Epitonium rupicola		0	0	0	0	0	
		Gastropoda (LPIL)		0	0	0	0	0	
		Bivalvia							
		Anadara transversa	PS, EQ	0	0	0	0	0	
		Amygdalum papyrium		0	0	0	0	0	
		Anomia simplex		0	0	0	0	0	
		Pododesmus rudis		0	0	0	0	0	
		Crassostrea virginica		0	0	0	0	0	
		Lyonsia hyalina		0	0	0	0	0	
		Mactridae (LPIL)		0	0	0	0	0	
		Mulinia lateralis	OP	0	0	0	0	0	
		Petricolaria pholadiformis		0	0	0	0	0	
		Tagelus plebeius	EQ	0	0	0	0	0	
		Tagelus sp.	PS, EQ?	0	0	0	0	0	
		Macoma tenta		0	0	0	0	0	
		Tellinidae (LPIL)		0	0	0	0	0	
		Gemma gemma	OP	0	0	0	0	0	
		Mercenaria mercenaria	PS, EQ	0	0	0	0	0	
		Pitar sp.		0	0	0	0	0	
		Veneridae (LPIL)		0	0	0	0	0	
		Bivalvia (LPIL)		0	0	0	0	0	
Phoronida									
		Phoronida (LPIL)		0	0	0	0	0	
Echinodermata									
		Ophiuroidea (LPIL)		0	0	0	0	0	
Chordata									
		Branchiostoma sp.		0	0	0	0	0	
		Total Raw Count		7	3	3	4	1	
		Number of Taxa		4	3	3	4	1	
		PS = Pollution Sensitive, Weisberg et al, 1997							
		PI = Polution Indicator, Weisberg et al. 1997							
		OP = Opportunistic, Ranasinghe et al. 1994							
		EQ = Equilibrium, Ranasinghe et al. 1994							
		? = Uncertanty due to taxonomic identification level							
Metrics									
				Total Raw Count	7	3	3	4	1
				Total Density (Number per Square Meter)	101	43	43	57	14
				Number of Taxa	4	3	3	4	1
				Shannon Diversity Index (Base e)	1.277	1.099	1.099	1.386	0
				Shannon Diversity Index (Base 2)	1.842	1.585	1.585	2	0
				Name of Dominant Taxon	Streblospio benedicti	Decapoda (LPIL) / Decapoda zoea (LPIL) / Neomysis americana	Neanthes succinea / Streblospio benedicti / Americamysis sp.	Porifera (LPIL) / Paraprionospio pinnata / Streblospio benedicti / Pinnixa sp.	Leptostraca (LPIL)
				Percent Contribution of Dominant Taxon	42.86	33.33	33.33	25.00	100.00
				Density (No./Square Meter) Dominant Taxon	43	14	14	14	14
				Percent Amphipods	0.00	0.00	0.00	0.00	0.00
				Percent Bivalves	0.00	0.00	0.00	0.00	0.00
				Percent Spionid Polychaetes	42.90	0.00	33.30	50.00	0.00
				Percent Mediomastus Polychaetes	0.00	0.00	0.00	0.00	0.00
				Percent Deposit Feeders	21.43	0	33.33	37.5	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD563	LW03-SD564	LW03-SD567	LW03-SD571	LW03-SD574
					LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C	LW03-SD571-00-10C	LW03-SD574-00-10C
					09/08/2010	09/08/2010	09/08/2010	09/08/2010	08/31/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	0	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	0	0	0	0	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0



Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD563	LW03-SD564	LW03-SD567	LW03-SD571	LW03-SD574
					LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C	LW03-SD571-00-10C	LW03-SD574-00-10C
					09/08/2010	09/08/2010	09/08/2010	09/08/2010	08/31/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	1	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	1	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		0	0	0	0	0
			Bivalvia (LPIL)		0	0	0	0	0
Phoronida									
			Phoronida (LPIL)		0	0	0	0	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		0	2	0	0	0
			Number of Taxa		0	2	0	0	0
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
					Total Raw Count	0	2	0	0
					Total Density (Number per Square Meter)	0	29	0	0
					Number of Taxa	0	2	0	0
					Shannon Diversity Index (Base e)	0	0.693	0	0
					Shannon Diversity Index (Base 2)	0	1	0	0
					Name of Dominant Taxon	N/A	Americamysis sp. / Neomysis americana	N/A	N/A
					Percent Contribution of Dominant Taxon	0	50.00	0	0
					Density (No./Square Meter) Dominant Taxon	0	14	0	0
					Percent Amphipods	0.00	0.00	0.00	0.00
					Percent Bivalves	0.00	0.00	0.00	0.00
					Percent Spionid Polychaetes	0.00	0.00	0.00	0.00
					Percent Mediomastus Polychaetes	0.00	0.00	0.00	0.00
					Percent Deposit Feeders	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-B5-SD401	LW07-B7-SD401	LW07-D5-SD401	LW07-F3-SD401	LW07-F5-SD401
					LW07-B5-SD401-00-10C	LW07-B7-SD401-00-10C	LW07-D5-SD401-00-10C	LW07-F3-SD401-00-10C	LW07-F5-SD401-00-10C
					09/12/2010	09/12/2010	09/11/2010	09/11/2010	09/11/2010
Porifera									
			Porifera (LPIL)		0	0	1	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	1	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	4	0	0	0
Nemertea									
			Nemertea (LPIL)		1	1	0	1	5
			Nemertea sp. A (LPIL)		2	0	1	0	0
			Nemertea sp. B (LPIL)		1	0	0	2	0
			Nemertea sp. C (LPIL)		0	0	0	0	1
			Nemertea sp. D (LPIL)		0	0	0	1	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	15	0	0	1
			Dorvilleidae (LPIL)		0	2	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	1	0	1	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	1	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	3	3	1	1	3
			Gyptis crypta		0	3	0	1	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	29	0	0	2
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	2	0	0	3
			Nereididae (LPIL)		0	2	0	0	1
			Platynereis dumerilii		0	9	0	1	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	1	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	1	0	0	0
			Grubeosyllis clavata		0	4	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	1	2	0	1	0
			Aphelochaeta sp.		0	0	0	0	1
			Cirratulidae (LPIL)		7	4	0	9	8
			Tharyx sp.		3	4	3	9	4
			Pectinaria gouldii		0	2	0	0	1
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	3	0	0	0
			Sabellaria vulgaris		0	1	0	0	0
			Sabellidae (LPIL)		0	2	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	36	0	0	1
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	10	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	1
			Dipolydora cauleri		0	1	0	0	0
			Dipolydora socialis		0	1	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	1	0	0	0
			Paraprionospio pinnata	PI, OP	14	11	6	4	0
			Polydora cornuta	PI, OP	2	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoleclepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	0	1	0	5	9
			Loimia medusa	PS	3	1	0	3	0
			Loimia sp.		1	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	1	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	1	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	1	0	0	0	1
			Mediomastus ambiseta	PS, PI, OP	0	18	0	2	13
			Mediomastus californiensis		0	11	0	0	0
			Mediomastus sp.		1	47	1	0	36
			Leitoscoloplos fragilis	PI, OP	1	1	0	0	3
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	1
			Sigambra tentaculata		2	1	1	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	6	0	1	2
			Tubificoides sp.		0	6	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-B5-SD401	LW07-B7-SD401	LW07-D5-SD401	LW07-F3-SD401	LW07-F5-SD401	
					LW07-B5-SD401-00-10C	LW07-B7-SD401-00-10C	LW07-D5-SD401-00-10C	LW07-F3-SD401-00-10C	LW07-F5-SD401-00-10C	
					09/12/2010	09/12/2010	09/11/2010	09/11/2010	09/11/2010	
Arthropoda										
	Malacostraca									
		Amphipoda								
			Aoridae (LPIL)		0	0	0	0	0	
			Monocorophium acherusicum		0	0	0	0	0	
			Monocorophium insidiosum		0	0	0	0	0	
			Monocorophium sp.		0	0	0	0	0	
			Listriella clymenellae	PS	0	0	0	0	0	
		Cumacea								
			Cyclaspis varians		0	0	0	0	0	
			Leucon americanus		0	0	0	1	0	
			Cumacea (LPIL)		0	0	0	0	0	
		Decapoda								
			Alpheus sp.	PS, EQ?	0	0	0	0	0	
			Palaemonetes sp.		0	0	0	0	0	
			Panopeidae (LPIL)		0	2	0	0	0	
			Panopeus herbstii		0	0	0	0	0	
			Rhithropanopeus harrisii		0	0	0	0	0	
			Pinnixa sp.		0	0	0	0	0	
			Callinectes sp.		0	0	0	0	0	
			Portunidae (LPIL)		0	0	0	0	0	
			Decapoda (LPIL)		0	0	0	0	0	
			Decapoda zoea (larva)		0	0	0	0	0	
		Isopoda								
			Edotia triloba		0	0	0	0	1	
		Leptostraca								
			Leptostraca (LPIL)		0	0	0	0	0	
		Mysida								
			Americamysis bigelowi		0	0	0	0	0	
			Americamysis sp.		0	0	0	0	0	
			Mysidae (LPIL)		0	0	0	0	0	
			Neomysis americana		0	0	0	0	0	
			Mysidacea (LPIL)		0	0	0	0	0	
		Stomatopoda								
			Squilla empusa	PS, EQ	0	0	0	0	0	
		Maxillopoda								
		Sessilia								
			Balanus improvisus		0	0	0	0	0	
			Balanomorpha (LPIL)		0	0	0	0	0	
		Entognatha								
			Collembola (LPIL)		0	0	1	0	0	
		Unspecified								
			Crustacea (LPIL)		0	0	0	0	0	
Mollusca										
		Gastropoda								
			Acteocina canaliculata	PS	21	7	0	20	6	
			Acteocina sp.		0	0	0	0	0	
			Odostomia engonia		1	0	1	0	1	
			Turbonilla interrupta		0	0	0	0	1	
			Astyris lunata		0	0	0	0	0	
			Nassarius vibex		0	0	0	0	0	
			Pyrgocythara plicosa		0	0	0	0	0	
			Crepidula fornicata		3	18	0	0	0	
			Crepidula plana		1	1	0	0	0	
			Cerithiopsis greenii		0	0	0	0	0	
			Epitonium rupicola		0	0	0	0	0	
			Gastropoda (LPIL)		2	2	0	0	0	
		Bivalvia								
			Anadara transversa	PS, EQ	0	3	0	0	0	
			Amygdalum papyrium		0	0	0	0	0	
			Anomia simplex		0	14	0	0	0	
			Pododesmus rudis		0	0	0	0	0	
			Crassostrea virginica		0	0	0	0	0	
			Lyonsia hyalina		1	0	0	0	0	
			Mactridae (LPIL)		0	0	0	3	1	
			Mulinia lateralis	OP	0	0	0	0	0	
			Petricolaria pholadiformis		1	0	0	0	0	
			Tagelus plebeius	EQ	0	0	0	0	0	
			Tagelus sp.	PS, EQ?	0	0	0	0	0	
			Macoma tenta		0	0	0	0	0	
			Tellinidae (LPIL)		0	0	0	0	0	
			Gemma gemma	OP	0	0	0	1	0	
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	
			Pitar sp.		0	0	0	0	0	
			Veneridae (LPIL)		5	12	0	0	2	
			Bivalvia (LPIL)		3	1	0	0	0	
Phoronida										
			Phoronida (LPIL)		25	8	0	5	12	
Echinodermata										
			Ophiuroidea (LPIL)		0	0	0	0	0	
Chordata										
			Branchiostoma sp.		0	0	0	0	0	
			Total Raw Count		106	319	16	72	121	
			Number of Taxa		25	50	9	20	27	
			PS = Pollution Sensitive, Weisberg et al, 1997							
			PI = Polution Indicator, Weisberg et al. 1997							
			OP = Opportunistic, Ranasinghe et al. 1994							
			EQ = Equilibrium, Ranasinghe et al. 1994							
			? = Uncertanty due to taxonomic identification level							
Metrics										
					Total Raw Count	106	319	16	72	121
					Total Density (Number per Square Meter)	1523	4583	230	1034	1739
					Number of Taxa	25	50	9	20	27
					Shannon Diversity Index (Base e)	2.54	3.217	1.895	2.465	2.589
					Shannon Diversity Index (Base 2)	3.665	4.641	2.733	3.556	3.736
					Name of Dominant Taxon	Phoronida (LPIL)	Mediomastus sp.	Paraprionospio pinnata	Acteocina canaliculata	Mediomastus sp.
					Percent Contribution of Dominant Taxon	23.58	14.73	37.50	27.78	29.75
					Density (No./Square Meter) Dominant Taxon	359	675	86	287	517
					Percent Amphipods	0.00	0.00	0.00	0.00	0.00
					Percent Bivalves	9.30	9.40	0.00	5.60	2.50
					Percent Spionid Polychaetes	15.10	4.70	37.50	12.50	8.30
					Percent Mediomastus Polychaetes	0.94	23.82	6.25	2.78	40.49
					Percent Deposit Feeders	22.17	36.21	50	38.89	63.23

Phylum	Class	Order	Taxon	Pollution Classification	LW07-H3-SD401	LW07-J4-SD401	LW07-K3-SD401	LW07-K4-SD401	LW07-K5-SD401
					LW07-H3-SD401-00-10C	LW07-J4-SD401-00-10C	LW07-K3-SD401-00-10C	LW07-K4-SD401-00-10C	LW07-K5-SD401-00-10C
					09/11/2010	09/11/2010	09/11/2010	09/11/2010	09/11/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	1
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	1	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	2	1	1	1	1
			Gyptis crypta		0	0	0	0	2
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	2	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	1
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		4	0	28	27	2
			Tharyx sp.		0	2	5	14	0
			Pectinaria gouldii		1	1	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	7	18	6	4	11
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	1	0
			Streblospio benedicti	PI, OP	14	22	13	2	7
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	1	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	1	1	0	1	4
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		5	8	7	0	3
			Leitoscoloplos fragilis	PI, OP	0	1	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		1	1	0	2	2
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	1	4	0	0	0
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-H3-SD401	LW07-J4-SD401	LW07-K3-SD401	LW07-K4-SD401	LW07-K5-SD401
					LW07-H3-SD401-00-10C	LW07-J4-SD401-00-10C	LW07-K3-SD401-00-10C	LW07-K4-SD401-00-10C	LW07-K5-SD401-00-10C
					09/11/2010	09/11/2010	09/11/2010	09/11/2010	09/11/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		1	0	1	0	1
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisii		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		1	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		1	0	2	0	1
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	5	5	4	1	2
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		2	1	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		2	0	0	1	1
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	1	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	1	0
			Gemma gemma	OP	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	1	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		0	1	0	0	0
			Bivalvia (LPIL)		0	0	1	0	0
Phoronida									
			Phoronida (LPIL)		2	3	5	3	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	1	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		52	71	75	59	39
			Number of Taxa		18	15	13	13	14
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
Total Raw Count					52	71	75	59	39
Total Density (Number per Square Meter)					747	1020	1078	848	560
Number of Taxa					18	15	13	13	14
Shannon Diversity Index (Base e)					2.456	2.061	1.997	1.746	2.269
Shannon Diversity Index (Base 2)					3.543	2.973	2.881	2.519	3.274
Name of Dominant Taxon					Streblospio benedicti	Streblospio benedicti	Cirratulidae (LPIL)	Cirratulidae (LPIL)	Paraprionospio pinnata
Percent Contribution of Dominant Taxon					26.92	30.99	37.33	45.76	28.21
Density (No./Square Meter) Dominant Taxon					201	316	402	388	158
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					5.70	1.40	1.30	10.20	2.60
Percent Spionid Polychaetes					40.40	56.30	25.30	11.90	46.20
Percent Mediomastus Polychaetes					11.54	12.68	9.33	1.69	17.52
Percent Deposit Feeders					45.19	52.12	66	77.11	47.44

Phylum	Class	Order	Taxon	Pollution Classification	LW07-L2-SD401-01	LW07-H1-SD401-01	LW07-K1-SD401	LW07-L5-SD401	LW07-M1-SD401
					W07-L2-SD401-01-10C	W07-H1-SD401-00-10C	W07-K1-SD401-00-10C	W07-L5-SD401-00-10C	W07-M1-SD401-00-10C
					09/11/2010	09/10/2010	09/10/2010	09/11/2010	09/10/2010
Porifera									
			Porifera (LPIL)		0	1	1	0	1
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	1
	Anthozoa								
			Actiniaria (LPIL)		0	0	1	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	1
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	1	0	0
			Gyptis crypta		0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	1
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0
			Tharyx sp.		1	0	0	0	13
			Pectinaria gouldii		0	0	0	0	1
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	4	0	0	3	1
			Polydora cornuta	PI, OP	0	0	2	0	1
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	4	34	41	4	52
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	1	0	1
			Capitella jonesi	PI, OP	0	0	2	0	0
			Capitella sp.	PI, OP	0	1	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	2	0	0	7
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		9	0	2	0	2
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	1	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		1	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	1	0	1	0	2
			Tubificoides sp.		0	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-L2-SD401-01	LW07-H1-SD401-01	LW07-K1-SD401	LW07-L5-SD401	LW07-M1-SD401
					W07-L2-SD401-01-10C-0	W07-H1-SD401-00-10C-0	W07-K1-SD401-00-10C-0	W07-L5-SD401-00-10C-0	W07-M1-SD401-00-10C-0
					09/11/2010	09/10/2010	09/10/2010	09/11/2010	09/10/2010
Arthropoda									
		Malacostraca							
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	1
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	1	0
			Decapoda zoea (larva)		0	0	0	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	1	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
		Gastropoda							
			Acteocina canaliculata	PS	6	2	0	3	1
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
		Bivalvia							
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Mactridae (LPIL)		1	0	0	2	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		1	0	1	1	0
			Bivalvia (LPIL)		0	0	0	0	1
Phoronida									
			Phoronida (LPIL)		1	0	0	0	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		29	40	54	15	87
			Number of Taxa		10	5	11	7	16
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
Total Raw Count					29	40	54	15	87
Total Density (Number per Square Meter)					417	575	776	216	1250
Number of Taxa					10	5	11	7	16
Shannon Diversity Index (Base e)					1.932	0.622	1.092	1.807	1.533
Shannon Diversity Index (Base 2)					2.788	0.898	1.576	2.606	2.211
Name of Dominant Taxon					Mediomastus sp.	Streblospio benedicti	Streblospio benedicti	Streblospio benedicti	Streblospio benedicti
Percent Contribution of Dominant Taxon					31.03	85.00	75.93	26.67	59.77
Density (No./Square Meter) Dominant Taxon					129	489	589	57	747
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					10.20	0.00	1.90	20.00	1.10
Percent Spionid Polychaetes					27.60	85.00	79.60	46.70	62.10
Percent Mediomastus Polychaetes					31.03	5.00	3.70	0.00	10.35
Percent Deposit Feeders					51.72	50	50.92	30	61.49

Phylum	Class	Order	Taxon	Pollution Classification	LW07-SD401	LW07-SD402	LW07-SD403-01	LW07-SD404	LW03-SD534-02
					LW07-SD401-00-10C	LW07-SD402-00-10C	LW07-SD403-00-10C-01	LW07-SD404-00-10C	LW03-SD534-02-10C
					09/11/2010	09/11/2010	09/11/2010	09/10/2010	09/01/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	1	0	0	0
	Anthozoa								
			Actiniaria (LPIL)		1	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	0	2	0	0	0
			Gyptis crypta		1	1	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0
			Podarke obscura		0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	1	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	1	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		1	1	0	10	0
			Tharyx sp.		0	5	0	3	0
			Pectinaria gouldii		0	2	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	1	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	1	6	0	5	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scoletepis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	31	67	31	44	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	29	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		1	19	1	35	0
			Leitoscoloplos fragilis	PI, OP	0	1	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	3	4	1	0	0
			Tubificoides sp.		0	0	0	0	0



Phylum	Class	Order	Taxon	Pollution Classification	LW07-SD401	LW07-SD402	LW07-SD403-01	LW07-SD404	LW03-SD534-02	
					LW07-SD401-00-10C	LW07-SD402-00-10C	LW07-SD403-00-10C-01	LW07-SD404-00-10C	LW03-SD534-02-10C	
					09/11/2010	09/11/2010	09/11/2010	09/10/2010	09/01/2010	
Arthropoda										
	Malacostraca									
		Amphipoda								
			Aoridae (LPIL)		0	0	0	0	0	
			Monocorophium acherusicum		0	0	0	0	0	
			Monocorophium insidiosum		0	0	0	0	0	
			Monocorophium sp.		0	0	1	0	0	
			Listriella clymenellae	PS	0	0	0	0	0	
		Cumacea								
			Cyclaspis varians		0	0	1	0	0	
			Leucon americanus		0	0	1	0	0	
			Cumacea (LPIL)		1	0	0	0	0	
		Decapoda								
			Alpheus sp.	PS, EQ?	1	0	0	0	0	
			Palaemonetes sp.		0	0	0	0	0	
			Panopeidae (LPIL)		0	0	0	0	0	
			Panopeus herbstii		0	0	0	0	0	
			Rhithropanopeus harrisii		0	0	0	0	0	
			Pinnixa sp.		0	0	0	0	0	
			Callinectes sp.		0	0	0	0	0	
			Portunidae (LPIL)		0	0	0	0	0	
			Decapoda (LPIL)		1	0	0	0	0	
			Decapoda zoea (larva)		0	0	0	0	0	
		Isopoda								
			Edotia triloba		0	0	0	0	0	
		Leptostraca								
			Leptostraca (LPIL)		0	0	0	0	0	
		Mysida								
			Americamysis bigelowi		0	0	0	0	0	
			Americamysis sp.		0	1	0	0	0	
			Mysidae (LPIL)		0	0	0	0	0	
			Neomysis americana		0	0	0	0	0	
			Mysidacea (LPIL)		0	0	0	0	0	
		Stomatopoda								
			Squilla empusa	PS, EQ	0	0	0	0	0	
		Maxillopoda								
		Sessilia								
			Balanus improvisus		0	0	0	0	0	
			Balanomorpha (LPIL)		0	0	0	0	0	
		Entognatha								
			Collembola (LPIL)		0	0	0	0	0	
		Unspecified								
			Crustacea (LPIL)		0	0	0	0	0	
Mollusca										
		Gastropoda								
			Acteocina canaliculata	PS	2	2	0	3	0	
			Acteocina sp.		0	0	0	0	0	
			Odostomia engonia		0	0	0	0	0	
			Turbonilla interrupta		0	0	0	0	0	
			Astyris lunata		0	0	0	0	0	
			Nassarius vibex		0	0	0	0	0	
			Pyrgocythara plicosa		0	0	0	0	0	
			Crepidula fornicata		0	0	0	0	0	
			Crepidula plana		0	0	0	0	0	
			Cerithiopsis greenii		0	0	0	0	0	
			Epitonium rupicola		0	0	0	0	0	
			Gastropoda (LPIL)		1	0	0	0	0	
		Bivalvia								
			Anadara transversa	PS, EQ	0	0	0	0	0	
			Amygdalum papyrium		0	0	0	0	0	
			Anomia simplex		0	0	0	0	0	
			Pododesmus rudis		0	0	0	0	0	
			Crassostrea virginica		0	0	0	0	0	
			Lyonsia hyalina		0	0	0	0	0	
			Mactridae (LPIL)		0	0	3	0	0	
			Mulinia lateralis	OP	0	0	0	0	0	
			Petricolaria pholadiformis		0	0	0	0	0	
			Tagelus plebeius	EQ	0	0	0	0	0	
			Tagelus sp.	PS, EQ?	0	0	1	0	0	
			Macoma tenta		0	0	0	0	0	
			Tellinidae (LPIL)		0	0	0	0	0	
			Gemma gemma	OP	0	0	0	0	0	
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	
			Pitar sp.		0	0	0	0	0	
			Veneridae (LPIL)		0	1	1	1	0	
			Bivalvia (LPIL)		0	0	0	2	0	
Phoronida										
			Phoronida (LPIL)		0	3	0	0	0	
Echinodermata										
			Ophiuroidea (LPIL)		0	0	0	0	0	
Chordata										
			Branchiostoma sp.		0	0	0	0	0	
			Total Raw Count		45	146	42	104	0	
			Number of Taxa		12	17	10	9	0	
			PS = Pollution Sensitive, Weisberg et al, 1997							
			PI = Polution Indicator, Weisberg et al. 1997							
			OP = Opportunistic, Ranasinghe et al. 1994							
			EQ = Equilibrium, Ranasinghe et al. 1994							
			? = Uncertanty due to taxonomic identification level							
Metrics										
					Total Raw Count	45	146	42	104	0
					Total Density (Number per Square Meter)	647	2098	603	1494	0
					Number of Taxa	12	17	10	9	0
					Shannon Diversity Index (Base e)	1.337	1.784	1.125	1.471	0
					Shannon Diversity Index (Base 2)	1.929	2.574	1.622	2.123	0
					Name of Dominant Taxon	Streblospio benedicti	Streblospio benedicti	Streblospio benedicti	Streblospio benedicti	N/A
					Percent Contribution of Dominant Taxon	68.89	45.89	73.81	42.31	0
					Density (No./Square Meter) Dominant Taxon	445	963	445	632	0
					Percent Amphipods	0.00	0.00	2.40	0.00	0.00
					Percent Bivalves	0.00	0.70	11.90	2.90	0.00
					Percent Spionid Polychaetes	71.10	50.00	73.80	47.10	0.00
					Percent Mediomastus Polychaetes	2.22	32.87	2.38	33.65	0.00
					Percent Deposit Feeders	46.67	66.78	41.66	69.71	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD534-03	LW03-SD550-02	LW03-SD550-03	LW03-SD558-02	LW03-SD558-03
					LW03-SD534-03-10C	LW03-SD550-02-10C	LW03-SD550-03-10C	LW03-SD558-02-10C	LW03-SD558-03-10C
					09/01/2010	09/08/2010	09/08/2010	09/08/2010	09/08/2010
Porifera									
			Porifera (LPIL)		0	0	0	0	0
Cnidaria									
	Hydrozoa								
			Hydrozoa (LPIL)		0	0	0	0	0
	Anthozoa								
			Actinaria (LPIL)		0	0	0	0	0
			Actinaria sp. A		0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0
Nemertea									
			Nemertea (LPIL)		0	0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0	0
			Nemertea sp. C (LPIL)		0	0	0	0	0
			Nemertea sp. D (LPIL)		0	0	0	0	0
Annelida									
	Polychaeta								
			Dorvillea (Schistomeringos) rudolphi		6	0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0
			Glycera sp.		0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0
			Glycinde solitaria	PS, OP	2	0	0	0	0
			Gyptis crypta		3	0	0	0	0
			Hesionidae (LPIL)		4	0	0	0	0
			Podarke obscura		5	0	0	0	0
			Laeonereis culveri		0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0
			Drilonereis longa		0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0
			Eteone sp.		0	0	0	0	0
			Eumida sanguinea		0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0
			Lepidonotus sp.		0	0	0	0	0
			Grubeosyllis clavata		0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0
			Tharyx sp.		0	0	0	0	0
			Pectinaria gouldii		1	0	0	0	0
			Pectinaria sp.		0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0
			Sabellaria vulgaris		0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0
			Hydroides diathus		0	0	0	0	0
			Hydroides sp.		2	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0
			Apoprionospio pygmaea		0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0
			Dipolydora socialis		0	0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0	0
			Minuspio sp.		0	0	0	0	0
			Paraprionospio pinnata	PI, OP	7	0	0	0	0
			Polydora cornuta	PI, OP	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0
			Scolecopsis texana		0	0	0	0	0
			Spio sp.		0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0
			Streblospio benedicti	PI, OP	0	1	0	0	0
			Loimia medusa	PS	0	0	0	0	0
			Loimia sp.		0	0	0	0	0
			Pista cristata		0	0	0	0	0
			Terebellidae (LPIL)		3	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0
			Heteromastus filiformis	PI, OP	1	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0
			Mediomastus sp.		1	0	0	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0
			Sigambra tentaculata		0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0
	Clitellata								
			Paranais frici		0	0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LP	PI	0	0	0	0	0
			Tubificoides sp.		2	0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW03-SD534-03	LW03-SD550-02	LW03-SD550-03	LW03-SD558-02	LW03-SD558-03
					LW03-SD534-03-10C	LW03-SD550-02-10C	LW03-SD550-03-10C	LW03-SD558-02-10C	LW03-SD558-03-10C
					09/01/2010	09/08/2010	09/08/2010	09/08/2010	09/08/2010
Arthropoda									
	Malacostraca								
		Amphipoda							
			Aoridae (LPIL)		0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0
		Cumacea							
			Cyclaspis varians		0	0	0	0	0
			Leucon americanus		0	0	0	0	0
			Cumacea (LPIL)		0	0	0	0	0
		Decapoda							
			Alpheus sp.	PS, EQ?	0	0	0	0	0
			Palaemonetes sp.		0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0
			Rhithropanopeus harrisii		0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0
			Callinectes sp.		0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0
			Decapoda (LPIL)		0	0	0	0	0
			Decapoda zoea (larva)		0	0	2	0	0
		Isopoda							
			Edotia triloba		0	0	0	0	0
		Leptostraca							
			Leptostraca (LPIL)		0	0	0	0	0
		Mysida							
			Americamysis bigelowi		0	0	0	0	0
			Americamysis sp.		0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0
			Neomysis americana		0	0	0	0	0
			Mysidacea (LPIL)		0	0	0	0	0
		Stomatopoda							
			Squilla empusa	PS, EQ	0	0	0	0	0
		Maxillopoda							
		Sessilia							
			Balanus improvisus		0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0
		Entognatha							
			Collembola (LPIL)		0	0	0	0	0
		Unspecified							
			Crustacea (LPIL)		0	0	0	0	0
Mollusca									
	Gastropoda								
			Acteocina canaliculata	PS	1	0	0	0	0
			Acteocina sp.		0	0	0	0	0
			Odostomia engonia		0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0
			Astyris lunata		0	0	0	0	0
			Nassarius vibex		0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0
			Crepidula plana		0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0
	Bivalvia								
			Anadara transversa	PS, EQ	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0
			Anomia simplex		1	0	0	0	0
			Pododesmus rudis		0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0
			Lyonsia hyalina		0	0	0	0	0
			Macridae (LPIL)		0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0
			Macoma tenta		0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0
			Pitar sp.		0	0	0	0	0
			Veneridae (LPIL)		2	0	0	0	0
			Bivalvia (LPIL)		0	0	0	0	0
Phoronida									
			Phoronida (LPIL)		0	0	0	0	0
Echinodermata									
			Ophiuroidea (LPIL)		0	0	0	0	0
Chordata									
			Branchiostoma sp.		0	0	0	0	0
			Total Raw Count		41	1	2	0	0
			Number of Taxa		15	1	1	0	0
			PS = Pollution Sensitive, Weisberg et al, 1997						
			PI = Polution Indicator, Weisberg et al. 1997						
			OP = Opportunistic, Ranasinghe et al. 1994						
			EQ = Equilibrium, Ranasinghe et al. 1994						
			? = Uncertanty due to taxonomic identification level						
Metrics									
Total Raw Count					41	1	2	0	0
Total Density (Number per Square Meter)					589	14	29	0	0
Number of Taxa					15	1	1	0	0
Shannon Diversity Index (Base e)					2.492	0	0	0	0
Shannon Diversity Index (Base 2)					3.595	0	0	0	0
Name of Dominant Taxon					Paraprionospio pinnata	Streblospio benedicti	Decapoda zoea (LPIL)	N/A	N/A
Percent Contribution of Dominant Taxon					17.07	100.00	100.00	0	0
Density (No./Square Meter) Dominant Taxon					101	14	29	0	0
Percent Amphipods					0.00	0.00	0.00	0.00	0.00
Percent Bivalves					4.90	0.00	0.00	0.00	0.00
Percent Spionid Polychaetes					17.10	100.00	0.00	0.00	0.00
Percent Mediomastus Polychaetes					2.44	0.00	0.00	0.00	0.00
Percent Deposit Feeders					24.4	50	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-L2-SD401-02	LW07-L2-SD401-03	LW07-H1-SD401-02	LW07-H1-SD401-03
					LW07-L2-SD401-02-10C-02	LW07-L2-SD401-03-10C-03	LW07-H1-SD401-00-10C-02	LW07-H1-SD401-00-10C-03
					09/11/2010	09/11/2010	09/10/2010	09/10/2010
Porifera								
			Porifera (LPIL)		1	0	0	0
Cnidaria								
	Hydrozoa							
			Hydrozoa (LPIL)		0	0	0	0
	Anthozoa							
			Actiniaria (LPIL)		0	0	0	0
			Actiniaria sp. A		0	0	0	0
			Anthozoa (LPIL)		0	0	0	0
Nemertea								
			Nemertea (LPIL)		0	0	0	0
			Nemertea sp. A (LPIL)		0	0	0	0
			Nemertea sp. B (LPIL)		0	0	0	0
			Nemertea sp. C (LPIL)		0	1	0	0
			Nemertea sp. D (LPIL)		0	0	0	0
Annelida								
	Polychaeta							
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0
			Dorvilleidae (LPIL)		0	0	0	0
			Marphysa sanguinea		0	0	0	0
			Glycera americana	PS, EQ	0	0	0	0
			Glycera dibranchiata		0	0	0	0
			Glycera sp.		0	0	0	0
			Ophioglycera sp.		0	0	0	0
			Glycinde solitaria	PS, OP	0	1	0	0
			Gyptis crypta		0	0	0	1
			Hesionidae (LPIL)		0	0	0	0
			Podarke obscura		0	0	0	0
			Laeonereis culveri		0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0
			Nereididae (LPIL)		0	0	0	0
			Platynereis dumerilii		0	0	0	0
			Drilonereis longa		0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0
			Eteone sp.		0	0	0	0
			Eumida sanguinea		0	0	0	0
			Phyllodoce mucosa		0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0
			Lepidonotus sp.		0	0	0	0
			Grubeosyllis clavata		0	0	0	0
			Syllidae (LPIL)		0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0
			Aphelochaeta sp.		0	0	0	0
			Cirratulidae (LPIL)		1	0	0	0
			Tharyx sp.		1	9	0	0
			Pectinaria gouldii		0	0	0	0
			Pectinaria sp.		0	0	0	0
			Demonax microphthalmus		0	0	0	0
			Sabellaria vulgaris		0	0	0	0
			Sabellidae (LPIL)		0	0	0	0
			Sabellinae (LPIL)		0	0	0	0
			Hydroides dianthus		0	0	0	0
			Hydroides diathus		0	0	0	0
			Hydroides sp.		0	0	0	0
			Serpulidae (LPIL)		0	0	0	0
			Apoprionospio pygmaea		0	0	0	0
			Dipolydora cauleri		0	0	0	0
			Dipolydora socialis		0	0	0	0
			Marenzelleria viridis	PS	0	0	0	0
			Minuspio sp.		0	0	0	0
			Paraprionospio pinnata	PI, OP	3	3	1	2
			Polydora cornuta	PI, OP	0	0	0	1
			Pseudopolydora sp.		0	0	0	0
			Scoletelepis texana		0	0	0	0
			Spio sp.		0	0	0	0
			Spionidae (LPIL)		0	0	0	0
			Streblospio benedicti	PI, OP	16	31	13	20
			Loimia medusa	PS	0	0	0	0
			Loimia sp.		0	0	0	0
			Pista cristata		0	0	0	0
			Terebellidae (LPIL)		0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	1	0	3
			Capitella jonesi	PI, OP	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	6	6	4	1
			Mediomastus californiensis		0	0	0	0
			Mediomastus sp.		4	12	0	0
			Leitoscoloplos fragilis	PI, OP	0	0	0	0
			Leitoscoloplos sp.		0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0
			Scoloplos rubra		0	0	0	0
			Sigambra tentaculata		1	0	0	1
			Clymenella torquata	PS, EQ	0	0	0	0
	Clitellata							
			Paranaeis frici		0	0	0	0
			Tubificoid Naididae imm. w/o hair setae (LPIL)	PI	1	0	0	1
			Tubificoides sp.		0	0	0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-L2-SD401-02	LW07-L2-SD401-03	LW07-H1-SD401-02	LW07-H1-SD401-03
					LW07-L2-SD401-02-10C-02	LW07-L2-SD401-03-10C-03	LW07-H1-SD401-00-10C-02	LW07-H1-SD401-00-10C-03
					09/11/2010	09/11/2010	09/10/2010	09/10/2010
Arthropoda								
		Malacostraca						
		Amphipoda						
			Aoridae (LPIL)		0	0	0	0
			Monocorophium acherusicum		0	0	0	0
			Monocorophium insidiosum		0	0	0	0
			Monocorophium sp.		0	0	0	0
			Listriella clymenellae	PS	0	0	0	0
		Cumacea						
			Cyclaspis varians		0	0	0	0
			Leucon americanus		0	1	0	0
			Cumacea (LPIL)		0	0	0	0
		Decapoda						
			Alpheus sp.	PS, EQ?	0	0	0	0
			Palaemonetes sp.		0	0	0	0
			Panopeidae (LPIL)		0	0	0	0
			Panopeus herbstii		0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0
			Pinnixa sp.		0	0	0	0
			Callinectes sp.		0	0	0	0
			Portunidae (LPIL)		0	0	0	0
			Decapoda (LPIL)		0	0	0	0
			Decapoda zoea (larva)		0	0	0	0
		Isopoda						
			Edotia triloba		0	0	0	0
		Leptostraca						
			Leptostraca (LPIL)		0	0	0	0
		Mysida						
			Americamysis bigelowi		0	1	0	1
			Americamysis sp.		0	0	0	0
			Mysidae (LPIL)		0	0	0	0
			Neomysis americana		0	0	0	0
			Mysidacea (LPIL)		0	0	0	0
		Stomatopoda						
			Squilla empusa	PS, EQ	0	0	0	0
		Maxillopoda						
		Sessilia						
			Balanus improvisus		0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0
		Entognatha						
			Collembola (LPIL)		0	0	0	0
		Unspecified						
			Crustacea (LPIL)		0	0	0	0
Mollusca								
		Gastropoda						
			Acteocina canaliculata	PS	0	1	1	1
			Acteocina sp.		0	0	0	0
			Odostomia engonia		0	0	0	0
			Turbonilla interrupta		0	0	0	0
			Astyris lunata		0	0	0	0
			Nassarius vibex		0	0	0	0
			Pyrgocythara plicosa		0	0	0	0
			Crepidula fornicata		0	0	0	0
			Crepidula plana		0	0	0	0
			Cerithiopsis greenii		0	0	0	0
			Epitonium rupicola		0	0	0	0
			Gastropoda (LPIL)		0	0	0	0
		Bivalvia						
			Anadara transversa	PS, EQ	0	0	0	0
			Amygdalum papyrium		0	0	0	0
			Anomia simplex		0	0	0	0
			Pododesmus rudis		0	0	0	0
			Crassostrea virginica		0	0	0	0
			Lyonsia hyalina		0	0	0	0
			Mactridae (LPIL)		0	0	0	0
			Mulinia lateralis	OP	0	0	0	0
			Petricolaria pholadiformis		0	0	0	0
			Tagelus plebeius	EQ	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0
			Macoma tenta		0	1	0	0
			Tellinidae (LPIL)		0	0	0	0
			Gemma gemma	OP	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0
			Pitar sp.		0	1	0	0
			Veneridae (LPIL)		0	1	0	1
			Bivalvia (LPIL)		1	0	0	0
Phoronida								
			Phoronida (LPIL)		1	1	0	0
Echinodermata								
			Ophiuroidea (LPIL)		0	0	0	0
Chordata								
			Branchiostoma sp.		0	0	0	0
			Total Raw Count		36	71	19	33
			Number of Taxa		11	15	4	11
			PS = Pollution Sensitive, Weisberg et al, 1997					
			PI = Polution Indicator, Weisberg et al. 1997					
			OP = Opportunistic, Ranasinghe et al. 1994					
			EQ = Equilibrium, Ranasinghe et al. 1994					
			? = Uncertanty due to taxonomic identification level					
Metrics								
Total Raw Count					36	71	19	33
Total Density (Number per Square Meter)					517	1020	273	474
Number of Taxa					11	15	4	11
Shannon Diversity Index (Base e)					1.807	1.867	0.898	1.539
Shannon Diversity Index (Base 2)					2.607	2.693	1.295	2.22
Name of Dominant Taxon					Streblospio benedicti	Streblospio benedicti	Streblospio benedicti	Streblospio benedicti
Percent Contribution of Dominant Taxon					44.44	43.66	68.42	60.61
Density (No./Square Meter) Dominant Taxon					230	445	187	287
Percent Amphipods					0.00	0.00	0.00	0.00
Percent Bivalves					2.80	4.20	0.00	3.00
Percent Spionid Polychaetes					52.80	47.90	73.70	69.70
Percent Mediomastus Polychaetes					27.78	25.35	21.05	3.03
Percent Deposit Feeders					62.5	63.38	57.89	50

Phylum	Class	Order	Taxon	Pollution Classification	LW07-SD403-02	LW07-SD403-03
					LW07-SD403-00-10C-02	LW07-SD403-00-10C-03
					09/11/2010	09/11/2010
Porifera						
			Porifera (LPIL)		0	0
Cnidaria						
	Hydrozoa					
			Hydrozoa (LPIL)		0	0
	Anthozoa					
			Actinaria (LPIL)		0	0
			Actinaria sp. A		0	0
			Anthozoa (LPIL)		0	0
Nemertea						
			Nemertea (LPIL)		0	0
			Nemertea sp. A (LPIL)		0	0
			Nemertea sp. B (LPIL)		0	0
			Nemertea sp. C (LPIL)		0	0
			Nemertea sp. D (LPIL)		0	0
Annelida						
	Polychaeta					
			Dorvillea (Schistomerings) rudolphi		0	0
			Dorvilleidae (LPIL)		0	0
			Marphysa sanguinea		0	0
			Glycera americana	PS, EQ	0	0
			Glycera dibranchiata		0	0
			Glycera sp.		0	0
			Ophioglycera sp.		0	0
			Glycinde solitaria	PS, OP	0	0
			Gyptis crypta		0	0
			Hesionidae (LPIL)		0	0
			Podarke obscura		0	0
			Laeonereis culveri		0	0
			Neanthes succinea	PI, OP	0	0
			Nereididae (LPIL)		0	0
			Platynereis dumerilii		0	0
			Drilonereis longa		0	0
			Diopatra cuprea	PS, EQ	0	0
			Eteone sp.		0	0
			Eumida sanguinea		0	0
			Phyllodoce mucosa		0	0
			Phyllodocidae (LPIL)		0	0
			Lepidonotus sp.		0	0
			Grubeosyllis clavata		0	0
			Syllidae (LPIL)		0	0
			Ampharetidae (LPIL)		0	0
			Spiochaetopterus costarum	PS	0	0
			Aphelochaeta sp.		0	0
			Cirratulidae (LPIL)		0	0
			Tharyx sp.		1	8
			Pectinaria gouldii		0	1
			Pectinaria sp.		0	0
			Demonax microphthalmus		0	0
			Sabellaria vulgaris		0	0
			Sabellidae (LPIL)		0	0
			Sabellinae (LPIL)		0	0
			Hydroides dianthus		0	0
			Hydroides diathus		0	0
			Hydroides sp.		0	0
			Serpulidae (LPIL)		0	0
			Apoprionospio pygmaea		0	0
			Dipolydora cauleri		0	0
			Dipolydora socialis		0	0
			Marenzelleria viridis	PS	0	0
			Minuspio sp.		0	0
			Paraprionospio pinnata	PI, OP	1	0
			Polydora cornuta	PI, OP	0	0
			Pseudopolydora sp.		0	0
			Scoletelepis texana		0	0
			Spio sp.		0	0
			Spionidae (LPIL)		0	0
			Streblospio benedicti	PI, OP	4	28
			Loimia medusa	PS	0	0
			Loimia sp.		0	0
			Pista cristata		0	0
			Terebellidae (LPIL)		0	0
			Capitella capitata complex Blake	PI, OP	1	0
			Capitella jonesi	PI, OP	0	0
			Capitella sp.	PI, OP	0	0
			Capitellidae (LPIL)		0	0
			Heteromastus filiformis	PI, OP	0	0
			Mediomastus ambiseta	PS, PI, OP	1	12
			Mediomastus californiensis		0	0
			Mediomastus sp.		0	3
			Leitoscoloplos fragilis	PI, OP	0	0
			Leitoscoloplos sp.		0	0
			Orbiniidae (LPIL)		0	0
			Scoloplos rubra		0	0
			Sigambra tentaculata		0	0
			Clymenella torquata	PS, EQ	0	0
	Clitellata					
			Paranais frici		0	0
			Tubificoid Naididae imm. w/o hair setae (LPIL)	PI	1	2
			Tubificoides sp.		0	0

Phylum	Class	Order	Taxon	Pollution Classification	LW07-SD403-02	LW07-SD403-03
					LW07-SD403-00-10C-02	LW07-SD403-00-10C-03
					09/11/2010	09/11/2010
Arthropoda						
		Malacostraca				
		Amphipoda				
			Aoridae (LPIL)		0	0
			Monocorophium acherusicum		0	0
			Monocorophium insidiosum		0	0
			Monocorophium sp.		0	1
			Listriella clymenellae	PS	0	0
		Cumacea				
			Cyclaspis varians		0	0
			Leucon americanus		0	0
			Cumacea (LPIL)		0	0
		Decapoda				
			Alpheus sp.	PS, EQ?	0	0
			Palaemonetes sp.		0	0
			Panopeidae (LPIL)		0	0
			Panopeus herbstii		0	0
			Rhithropanopeus harrisi		0	0
			Pinnixa sp.		0	0
			Callinectes sp.		0	0
			Portunidae (LPIL)		0	0
			Decapoda (LPIL)		0	0
			Decapoda zoea (larva)		0	0
		Isopoda				
			Edotia triloba		0	0
		Leptostraca				
			Leptostraca (LPIL)		0	0
		Mysida				
			Americamysis bigelowi		0	0
			Americamysis sp.		0	0
			Mysidae (LPIL)		0	0
			Neomysis americana		0	0
			Mysidacea (LPIL)		0	0
		Stomatopoda				
			Squilla empusa	PS, EQ	0	0
		Maxillopoda				
		Sessilia				
			Balanus improvisus		0	0
			Balanomorpha (LPIL)		0	0
		Entognatha				
			Collembola (LPIL)		0	0
		Unspecified				
			Crustacea (LPIL)		0	0
Mollusca						
		Gastropoda				
			Acteocina canaliculata	PS	2	0
			Acteocina sp.		0	0
			Odostomia engonia		0	0
			Turbonilla interrupta		0	0
			Astyris lunata		0	0
			Nassarius vibex		0	0
			Pyrgocythara plicosa		0	0
			Crepidula fornicata		0	0
			Crepidula plana		0	0
			Cerithiopsis greenii		0	0
			Epitonium rupicola		0	0
			Gastropoda (LPIL)		0	0
		Bivalvia				
			Anadara transversa	PS, EQ	0	0
			Amygdalum papyrium		0	0
			Anomia simplex		0	0
			Pododesmus rudis		0	0
			Crassostrea virginica		0	0
			Lyonsia hyalina		0	0
			Mactridae (LPIL)		1	1
			Mulinia lateralis	OP	0	0
			Petricolaria pholadiformis		0	0
			Tagelus plebeius	EQ	0	0
			Tagelus sp.	PS, EQ?	0	0
			Macoma tenta		0	0
			Tellinidae (LPIL)		0	0
			Gemma gemma	OP	0	0
			Mercenaria mercenaria	PS, EQ	0	0
			Pitar sp.		0	0
			Veneridae (LPIL)		0	1
			Bivalvia (LPIL)		0	0
Phoronida						
			Phoronida (LPIL)		0	0
Echinodermata						
			Ophiuroidea (LPIL)		0	0
Chordata						
			Branchiostoma sp.		0	0
			Total Raw Count		12	57
			Number of Taxa		8	9
			PS = Pollution Sensitive, Weisberg et al, 1997			
			PI = Polution Indicator, Weisberg et al. 1997			
			OP = Opportunistic, Ranasinghe et al. 1994			
			EQ = Equilibrium, Ranasinghe et al. 1994			
			? = Uncertanty due to taxonomic identification level			
Metrics						
Total Raw Count					12	57
Total Density (Number per Square Meter)					172	819
Number of Taxa					8	9
Shannon Diversity Index (Base e)					1.907	1.509
Shannon Diversity Index (Base 2)					2.752	2.177
Name of Dominant Taxon					Streblospio benedicti	Streblospio benedicti
Percent Contribution of Dominant Taxon					33.33	49.12
Density (No./Square Meter) Dominant Taxon					57	402
Percent Amphipods					0.00	1.80
Percent Bivalves					8.30	3.60
Percent Spionid Polychaetes					41.70	49.10
Percent Mediomastus Polychaetes					8.33	26.31
Percent Deposit Feeders					54.17	70.18

**Attachment D**  
**Ecological Risk Evaluation**

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# Ecological Risk Evaluation

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## D.1 Introduction

This attachment contains an ecological risk evaluation of additional data collected at SWMU 3 in August and September 2010 subsequent to the completion of the Supplemental Remedial Investigation (SRI) report (CH2M HILL, August 2009). These additional data include surface sediment and benthic invertebrates systematically collected throughout the entire site (**Figure D-1**). The purpose of these additional data was to help evaluate the remedial alternatives to be developed as part of a Feasibility Study (FS) and to provide a baseline for measuring the achievement of the preliminary remedial action objective (RAO) developed for the site.

### D.1.1 Previous Ecological Risk Assessments

A number of ecological risk assessments (ERAs) have been conducted at SWMU 3. The results of these ERAs are summarized in the following subsections.

#### D.1.1.1 Site Investigation (SI) and Remedial Investigation (RI)

A draft ERA, through Step 3A of the ERA process, was previously completed for SWMU 3 in 2001 (CH2M HILL, January 2001) and was based upon analytical data collected as part of the 1998 SI. Subsequent to the completion of the 2001 ERA, additional sediment, surface soil, subsurface soil, surface water, and groundwater samples were collected at SWMU 3 as part of the RI (CH2M HILL, August 2005). This additional sampling included a number of sediment, surface water, soil, and groundwater locations not evaluated in the 2001 ERA. The 2005 RI included an ERA that reiterated Steps 1-3A of the ERA process, incorporating these new data, and concluded the following:

- The terrestrial portions of SWMU 3 are highly developed and the resulting low quality of the habitat present (pavement, asphalt, or hard-packed dirt with sparse herbaceous plants) results in a lack of significant exposure pathways to ecological receptors. Abrasive blast material (ABM) is still present on the ground surface in many areas, however, and there is the possibility of continued transport to Little Creek Harbor via wind and surface runoff.
- In surface sediment (0 to 4 inch depth), metals (particularly copper, lead, mercury, nickel, tin, and zinc) and polycyclic aromatic hydrocarbons (PAHs) were identified as chemicals of concern (COCs). Metal concentrations were generally higher in surface sediment samples, although the maximum mercury concentration was higher in subsurface sediment (>4 inch depth) samples. PAH concentrations were generally similar between surface and subsurface sediment samples. The maximum observed depth of ABM was approximately 4 feet below the sediment surface. This suggests some mixing within the top several feet of the sediment column and/or a fairly high rate of sediment deposition. As such, many of the key COCs in surface sediment (i.e., copper, lead, mercury, nickel, tin, zinc, and PAHs) exceeded screening values in subsurface sediment samples.
- In general, COC sediment concentrations were highest in the Near Shore Area and lowest in the Marina (mercury was a notable exception). This pattern is consistent with the known site history and proximity to source areas. Simultaneously Extracted Metals / Acid Volatile Sulfide (SEM/AVS) ratios from surface sediment samples suggest that metal bioavailability is relatively low in the Marina but higher elsewhere. A comparison of surface sediment concentrations to equilibrium partitioning-based sediment values, which incorporate a measure of bioavailability, suggests that potential PAH exposures and risks are higher in the Near Shore Area and low elsewhere.
- The benthic invertebrate community found in Little Creek Harbor in the vicinity of SWMU 3 appears to be significantly impaired. During the RI sampling, numerous attempts were made to collect benthic invertebrate samples. Only 3 of these attempts resulted in any material being retained in the sieve (No. 30 sieve bucket) and only 2 of these 3 samples contained organisms. Two samples (LW03-C-BI203 and LW03-D-BI201) were

collected from areas where ABM was visible. One sample (LW03-BI205) was collected where no ABM was visible. Just 5 total organisms were found in these 3 samples.

- Although copper was identified as a COC in surface water, it was not considered a risk driver based upon the magnitude of its mean hazard quotient (HQ) in filtered samples.
- Except for mercury, there were no exceedances (based upon Lowest Observed Adverse Effect Levels [LOAELs]) for aquatic-based food web exposures (modeled from surface sediment concentrations).
- Groundwater does not appear to be a significant transport route from the site to Little Creek Harbor (that is, it does not produce unacceptable risks to biota) based upon a comparison to surface water screening values (assuming a dilution factor of 10), and consideration of upgradient and background concentrations<sup>1</sup>.
- In summary, the highest site-related risks are associated with metals and PAHs in harbor sediments, particularly in the Near Shore Area.

The following recommendations were made:

- The low quality of the terrestrial habitats present on the site suggests that significant direct exposures for terrestrial receptors are unlikely. However, the presence of ABM residues in terrestrial areas is a potential continuing source of contaminants (via erosion and runoff) to Little Creek Harbor. It is recommended that these residues be removed to eliminate this transport pathway.
- Potential risks from sediment exposures in Little Creek Harbor are high in some areas (such as the Near Shore Area). It is therefore recommended that the ERA for SWMU 3 proceed to Step 4 of the ERA process in order to better quantify these potential risks.

#### D.1.1.2 Supplemental Remedial Investigation (SRI)

The results of the 2005 RI and ERA suggested that the sediments adjacent to SWMU 3 had been impacted as a result of historical site activities related to sandblasting. Because there was a demonstrated impact, it was decided not to proceed with a formal Step 4 ERA work plan to collect biological and toxicological data. Rather, it was decided to focus the subsequent investigation on additional sediment sampling to assess the spatial limits of ABM and to determine if there was a correlation between the metal COCs identified in the ERA and ABM in sediment. The Tier 1 Partnering Team concurred with this approach. Thus, the January/February 2007 sampling to support the SRI had the following objectives:

- Delineate the lateral and vertical extent of ABM in sediment.
- Assess the correlation between ABM, metal concentrations, and potential impacts to ecological receptors in surface sediment.

The 2007 SRI sampling consisted of Ponar/Vibracore sampling along 6 transects (**Figure D-2**). Surface sediment samples were collected at 60-foot intervals from 0-4 inches using a Ponar dredge and 6-foot sediment cores were collected at 120-foot intervals using a Vibracore along each transect. Sampling activities continued along each transect until ABM was absent from two consecutive sample locations. These transects were intended to fill spatial gaps in the existing sampling (the 2002 RI sampling used identical methods) by extending existing transects and adding new transects. Surface sediment samples were collected at the end of each transect and analyzed for copper, lead, mercury, nickel, tin, zinc (the metal COCs), total organic carbon (TOC), AVS/SEM, and grain size. Ten additional surface sediment samples were collected on these transects from locations with varying ABM content and analyzed for the same parameters (3 samples were also analyzed for tributyltin). Subsurface sediment samples (7 total) were also collected from locations of varying ABM content (correlated with surface locations) and analyzed for the metal COCs. A bathymetric survey of the harbor/channel in the vicinity of SWMU 3 was also conducted to obtain information on the depth profile/bottom contours in the area.

<sup>1</sup> An additional evaluation of the groundwater to surface water pathway was conducted in April 2010 at SWMU 3. The results of that evaluation also indicated that groundwater discharging to surface water was not a significant transport route of site-related constituents to Little Creek Harbor.

A revised ecological risk assessment, incorporating the results of the additional sampling described above, was conducted as part of the SRI to assess the potential risks to ecological receptors from exposure to metals and PAHs in Little Creek Harbor sediments located adjacent to SWMU 3. Based upon the results of the ERA included in the RI prepared in August 2005, the Tier 1 Partnering Team (Department of the Navy (Navy), U.S. Environmental Protection Agency (USEPA), and the Virginia Department of Environmental Quality (VDEQ)) agreed there are no unacceptable ecological risks associated with direct or indirect exposure to site surface soil, groundwater, and/or surface water.

COC concentrations detected in surface sediment samples exceeded at least one ecological screening value (TEL, ER-L, PEL, and/or ER-M) in all samples collected. With the exception of zinc at two locations, all samples collected from the transect ends were below the ER-M. The comparison to sediment screening values and the 2002 benthic community survey data both suggested that ABM-related constituents (copper, lead, nickel, tin, and zinc) from the site, as well as mercury and PAHs (which are likely to have other sources besides SWMU 3), had adversely impacted the benthic invertebrate community in the portions of Little Creek Harbor adjacent to SWMU 3 (particularly the Near Shore Area). Bioavailability measures suggested that these constituents may be bioavailable in at least some areas. Because of this, the Navy, in partnership with USEPA, VDEQ, and the Region 3 BTAG, agreed again not to conduct additional biological and toxicological sampling. Rather, it was decided to focus on defining the spatial limits (lateral and vertical) of ABM (which is known to be directly related to SWMU 3 and can thus serve as an unambiguous indicator of site influence) and to determine if there was a correlation between the metal COCs and ABM in surface sediments.

Based upon the results of the ERA included in the SRI, ABM was significantly correlated with the ABM-related metals in surface sediments and is a good indicator of site influence for defining the spatial extent of contamination, and of unacceptable risks when linked to an effects-based toxicity value such as an ER-L or ER-M. The ERA recommended that: (1) PRGs for sediment be developed based upon the extent of ABM, which is significantly correlated with the concentrations of the primary sediment COCs (copper, lead, tin, nickel, and zinc) and is known to be attributable to SWMU 3; (2) mercury and total PAHs be considered during PRG development, but only as secondary factors based upon their lack of correlation with ABM and poor spatial linkage to SWMU 3; and (3) facility-specific background surface sediment concentrations (from July 2007 samples collected in Little Creek Cove; [Table D-1](#)) should be considered during PRG development.

In June 2007, the Navy, in partnership with USEPA and VDEQ, agreed to collect background sediment samples from an urban cove area unaffected by sandblasting activities for use in developing remediation goals for SWMU 3. Following a review of historical data, the northern portion of Little Creek Cove was identified as a potentially suitable area for this purpose. Similar to SWMU 3, Little Creek Cove receives storm water runoff from various locations within the facility, including other CERCLA (but non-ABM) sites within the ER Program. As discussed in the SRI, the background sediment samples were similar in terms of physical characteristics to SWMU 3 surface sediment samples but tended to be higher in TOC and composed of a slightly higher percentage of fines (silt/clay). This introduces some uncertainty into their use at SWMU 3 since higher levels of TOC and fines suggest higher levels of deposition in the background area relative to SWMU 3. However, the range of concentrations in the background sediment samples was narrow (low variability), which suggests that these samples represent urban background for this general geographical area. During the development of the sediment PRGs, the use of these urban background sediment data was considered by the partnering team, and the uncertainties associated with their use at SWMU 3 were deemed acceptable and the data were thus deemed suitable for PRG development (see Section D.1.1.3).

#### **D.1.1.3 Development of Sediment Preliminary Remediation Goals (PRGs)**

Following the completion of the SRI, the Tier 1 Partnering Team agreed to proceed with the establishment of remedial action objectives (RAOs) and the development of sediment PRGs. The preliminary sediment RAO developed for the protection of the environment was as follows:

- Remove ABM-containing sediments and associated metals from the site to the greatest extent practicable to allow a benthic invertebrate community consistent with the urban nature of Little Creek Harbor to become established.

Sediment PRGs were developed for the primary COCs (copper, lead, nickel, tin, and zinc) utilizing regression equations relating percent ABM to metals concentrations (as described below), literature-based sediment screening values, and urban background sediment data. Mercury and PAHs are not attributable to a historic CERCLA release, therefore PRGs were not established for these constituents. These constituents will be considered qualitatively when delineating any remediation area.

As part of the SRI, simple linear regression was used to investigate potential correlations between the metal concentrations in surface sediments and the amount of ABM present. All surface sediment samples from 2002 and 2007 for which ABM was quantified were used in the analysis. The 2002 and 2007 surface sediment data indicate a relatively strong (and statistically significant) positive correlation between the ABM content in surface sediment samples and the concentrations of copper, lead, nickel, tin, and zinc (the primary sediment COCs). This correlation was improved by the removal of several outliers ([Figure D-2](#)), as follows:

- LW03-C-SD201-00-02C (very high ABM and metals)
- LW03-H-SD307-0001 (very high ABM but low metals)
- LW03-I-SD317-0001 (very high ABM but low metals)

The outliers (H-SD307 and I-SD317) with very high ABM content but low concentrations of metals may possibly represent pure (unused) ABM deposited in these locations. With the 3 outliers removed, the correlation coefficients ( $r^2$  values) were as follows:

- Copper (0.67;  $p < 0.01$ )
- Lead (0.73;  $p < 0.01$ )
- Nickel (0.45;  $p < 0.01$ )
- Tin (0.77;  $p < 0.01$ )
- Zinc (0.59;  $p < 0.01$ )

The resulting regression equations ([Table D-2](#)) were used to calculate associated sediment concentrations using 1 percent ABM (the lowest possible integer; also, percent ABM in sediment was only estimated to the nearest integer during the 2007 SRI sampling and the regression equations were developed as part of the SRI using the 2002 and 2007 data). These values, along with consideration of site-specific background concentrations and literature-based sediment effect levels (ER-L, ER-M, TEL, and PEL), were used to define the sediment PRGs for the five primary COCs (copper, lead, nickel, tin, and zinc). The PRGs for copper, lead, and tin were based upon the regression equations (at 1 percent ABM); none of these PRGs exceeded the ER-M (where available) and all were reasonably comparable to the maximum background concentration ([Table D-3](#)). The PRG for nickel was set at the maximum background concentration because maximum background exceeded the regression-derived value and was below the ER-M. For zinc, the ER-M was selected as the PRG because the regression-derived value exceeded all effects-based criteria. It should be noted, however, that the maximum background value for zinc also exceeded the ER-M ([Table D-3](#)).

In 2009, the PRGs were used to preliminarily define lateral extent through the calculation of a “Remediation Quotient” or RQ. The RQ was defined as the ratio of the PRG to the sediment concentration. The RQ was calculated for each of the five primary COCs and for each available surface sediment sample. A sample was defined as being “impacted” if the average RQ for the five COCs exceeded one or if the RQ for one or more individual COCs exceeded 1.5. The two secondary COCs (mercury and total PAHs) were qualitatively considered when defining the lateral boundary (using the ER-M values for each of these constituents). The resulting 2009 preliminary impacted sediment lateral boundary is shown on [Figure D-1](#). This boundary met the following criteria: (1) visible ABM is less than 1 percent; (2) the average RQ is less than 1; and (3) no individual RQ exceeds 1.5.

In November 2009, additional sediment sampling was conducted to define the vertical extent. To perform the vertical delineation, the site was divided into a 100-foot-by-100-foot grid system. Sediment cores were collected from within each grid sector located within the lateral boundary and the maximum vertical extent of ABM (greater than 1 percent) was visually identified. A 6-inch vertical sample was then taken from the sediment core just below this ABM-defined depth and analyzed for the metal COCs. If the RQ criteria were met in this sample, no

additional samples at deeper depths were analyzed. As documented in the final, approved SAP (CH2M HILL, December 2009), the vertical extent was defined as the shallowest depth at which the RQs were below established criteria. Following the November 2009 sampling event, the boundary was refined to include all “impacted” grid sectors as previously defined. The preliminary 2009 lateral and vertical boundary of potentially impacted sediment, as defined utilizing data collected as of November 2009, encompasses an area of approximately 13.3 acres and consists of approximately 61,266 cubic yards of sediment (**Figure D-1**).

### D.1.2 Subsequent Sampling

Following a review of risk reduction alternatives versus overall remedial action cost, the Tier 1 Partnering Team agreed, in March/April 2010, that benthic invertebrate sampling was warranted to further evaluate remedial alternatives and to provide a baseline to measure RAO achievement. In May 2010, the Tier 1 Partnering Team began scoping the benthic invertebrate sampling and analysis plan (SAP).

In August and September 2010, additional surface sediment sampling was conducted to evaluate the current condition of the benthic invertebrate community within Little Creek Harbor adjacent to SWMU 3, based upon the 2009 preliminary impacted sediment lateral boundary defined in Section D.1.1.3. This area was divided into 100 x 100 foot square grids (**Figure D-1**). Composite surface sediment samples (comprised of three subsamples) were collected within each grid and analyzed for copper, lead, nickel, tin, zinc, total organic carbon (TOC), pH, AVS/SEM, and grain size. Percent ABM was quantitatively measured. Surface water parameter measurements (pH, specific conductance, salinity, turbidity, temperature, dissolved oxygen, and oxidation-reduction potential) were collected from the top, middle, and bottom of the water column at the center point of each grid. Benthic invertebrate samples (composite) were also collected from each grid (see Section D.5.2). The benthic invertebrate taxonomy report is included as **Attachment B** of the technical memorandum (TM). Per discussions by the Tier 1 Partnering Team, due to the interconnectedness of Little Creek Harbor and Little Creek Cove, the dynamic nature of the system, and Little Creek Cove’s receipt of storm water runoff from various locations within the facility, including other CERCLA sites within the ER Program, the sampling of a reference area for benthic invertebrates (in Little Creek Cove) was removed from the SAP.

### D.1.3 Scope and Objectives of the Ecological Risk Evaluation

This evaluation is limited to the sediment of Little Creek Harbor adjacent to SWMU 3 and to the primary COCs identified in the SRI (copper, lead, nickel, tin, and zinc). Only the 2010 data are quantitatively evaluated.

As described in Section D.1.1, there are no unacceptable ecological risks associated with the terrestrial portions of the site due to the lack of significant exposure pathways. Groundwater does not appear to be a significant transport route from the site to Little Creek Harbor for ABM-related constituents. No new surface water data have been collected from the site because no risk drivers were identified for this medium in previous assessments.

As documented in the 2010 SAP (CH2M HILL, October 2010), the primary objective of the SWMU 3 investigation is to evaluate the current condition of the benthic invertebrate community within the 2009 preliminary impacted sediment lateral boundary to support the evaluation of remedial alternatives in the FS and to assist in measuring remedy success against the RAO. The environmental questions to be answered are as follows:

- What is the composition and condition of the existing benthic invertebrate community at SWMU 3 and how does it vary spatially throughout the site?
- Is the composition and condition of the existing benthic invertebrate community at SWMU 3 correlated with the concentration of the COCs and/or the presence of ABM?

Due to scheduled maintenance of the Dry Dock in 2012, an Engineering Evaluation and Cost Analysis (EE/CA) was to be prepared for completion of a non-time-critical removal action (NTCRA) in the northern portion of the site and the area surrounding the Dry Dock. Therefore, a third environmental question was included in the SAP as follows:



- What is the site condition following completion of the NTCRA, and what action is required at SWMU 3 to meet the RAO and what is the spatial extent of such an action?

Following additional Team discussion, it was agreed the site would be addressed as a whole under the completion of a FS, Proposed Plan, and Record of Decision; therefore, a NTCRA will not be completed. Thus, the third environmental question from the SAP was modified as follows:

- What action is required at SWMU 3 to meet the preliminary RAO and what is the spatial extent of such an action?

The focus of this ecological risk evaluation is to address the project objective and to answer the three environmental questions developed as part of the 2010 SAP (modified as described above).

## D.2 Problem Formulation

Problem formulation establishes the goals, scope, and focus of the evaluation. As part of problem formulation, the environmental setting of SWMU 3 is characterized in terms of the habitats and biota known or likely to be present. The types and concentrations of chemicals present in ecologically relevant media (in this case sediment) are also described. A conceptual model is developed that describes source areas, transport pathways and exposure media, exposure pathways and routes, and receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are developed to evaluate those receptors for which critical exposure pathways exist.

### D.2.1 Environmental Setting

SWMU 3 is located in a developed area on the western side of Little Creek Harbor ([Figure D-3](#)). This area was used for sandblasting boats from 1962 to 1984, after which anchors and anchor chains were sandblasted at the site. Up until 1995, sandblasting took place on a concrete pad located on the western side of Building 1263 ([Figure D-4](#)). The sandblast material was periodically removed from the site for disposal following EP toxicity testing; results indicated that the material was non-hazardous. Paint chips and sandblast grit cover the unpaved ground south of the pad to the water's edge and were also observed on the near shore bottom of Little Creek Harbor. In 1982, a fence was installed around the sandblasting area to limit access to the site and to prevent windblown sandblast materials from migrating outside of the fenced area. This fence is generally closed and locked outside working hours. Photographs taken in 1993 indicate that the area within the fence had been covered with asphalt except for a very small strip of land to the east of the sandblasting pit and a small area in the northeastern corner of the fenced compound. Small unpaved areas also occur northwest, north, and south of the fenced area. Little or no vegetation covers these unpaved areas.

In 1995, the initial sandblasting pad was taken out of service and a new sandblasting area was constructed in the northwestern corner of the compound. This new area consisted of a concrete pad surrounded by a 4- to 5-foot-high concrete wall. The use of this new area was discontinued in 1996 when all sandblasting activities were moved to an indoor facility near SWMU 7. However, some sandblasting and boat painting does occur within the confined space of the floating dry dock located at Pier 10.

Historical releases from SWMU 3 likely occurred when sandblasting residue was lying directly on the ground surface. Prior to 1993, runoff from sandblasting operations occurred as sheet flow to Little Creek Harbor. In about 1993, a catch basin with a regulated outfall was constructed at the site. Surface water drainage from the sandblasting area constructed in 1995 flows to this catch basin and empties into Little Creek Harbor at the outfall located under Pier 10 (Outfall 008) about 35 feet from its easternmost edge ([Figure D-4](#)). Runoff from other areas of SWMU 3 flows directly (as sheet flow) into Little Creek Harbor.

NAB Little Creek maneuvers are practiced in the Pier 10 area of Little Creek Harbor and a recreational marina for use by military dependents and former active duty members is located just south of SWMU 3 ([Figure D-4](#)). The marina contains a fueling station and fish cleaning station south of the boat slips. As a precautionary measure, at the request of NAB Little Creek environmental personnel, a picnic area in the southwestern portion of SWMU 3 was covered with three inches of topsoil and sod in April 1999 to minimize any potential exposure to the visible ABM present.

In 1999, 2 to 5 feet of sediments were removed from around Pier 10. Some minor sediment removal also occurred in the vicinity of the floating dry dock at Pier 10 just prior to the start of the RI sampling (Fall 2002). Little Creek Channel (not including the Near Shore sediments directly adjacent to SWMU 3) has been regularly dredged since 1928. It was last known to be dredged in 2001. The channel depth is now approximately 27 feet below mean low water (mlw). In 1965, Piers 1–8 (located south of SWMU 3) were dredged to 18 feet below mlw, plus a 2-foot overdepth.

The salinity of Little Creek Harbor in the vicinity of SWMU 3 is generally between 15 and 25 parts per thousand (ppt) near the surface and the in middle of the water column ([Tables D-4 and D-5](#)). At the bottom of the water column, the salinity tends to be slightly higher, generally between about 18 and 26 ppt ([Tables D-4 and D-5](#)).

The total organic carbon (TOC) concentration in surface sediments is highly variable, ranging from 0.01 to 6.52 percent ([Tables D-6 and D-7](#)). The sediment pH is typically about 8.0. The percent fines (silt and clay) is also highly variable, ranging from 1.87 to 97.5 percent ([Tables D-6 and D-7](#)). The depth to the redox boundary is typically only a few millimeters. The SEM/AVS ratio, a measure of metal bioavailability, rarely exceeded one (indicating low bioavailability) in the August/September 2010 surface sediment samples (2 of 60 samples) and in the February 2007 surface sediment samples (1 of 7), but exceeded one in 50 percent (3 of 6) of the surface sediment samples collected in October 2002 ([Tables D-6 and D-7](#)).

Visible ABM was observed in surface (0 to 4 inch) sediment samples collected from Near Shore areas of SWMU 3 during the SI. During the sampling conducted as part of the RI and SRI, ABM was observed in nearly all surface sediment samples at quantities ranging from less than 1 percent to 97 percent. ABM was also observed in most RI and SRI sediment cores down to a maximum depth of 88 inches ([Table D-6](#)). Petroleum material and/or petroleum odors were also prevalent in some sediment cores, generally at depths of 30 to 60 inches ([Table D-6](#)). In 2010 surface sediment samples, ABM was present in almost all (57 of 58; percent ABM was not measured at two locations) samples at concentrations ranging from trace to 50 percent. ABM exceeded 1 percent in 24 of 58 samples ([Table D-7](#)).

As documented in the 2005 RI report, no state or federally listed threatened or endangered species are known to occur on or near SWMU 3. Various species of estuarine fish are likely to use the area near SWMU 3 at least periodically.

The benthic invertebrate community found in Little Creek Harbor in the vicinity of SWMU 3 appears to be significantly impaired. During the 2002 RI sampling, numerous attempts were made to collect benthic invertebrate samples. Only 3 of these attempts resulted in any material being retained in the sieve (No. 30 sieve bucket) and only 2 of these 3 samples contained organisms. Two samples (LW03-C-BI203 and LW03-D-BI201) were collected from areas where ABM was visible. One sample (LW03-BI205) was collected where no ABM was visible. Just 5 organisms were found in these 3 samples ([Table D-8](#)).

During the 2010 sampling, organism counts were highly variable but most locations had low numbers of organisms. Of the 60 cells sampled, 14 (23.3%) had zero organisms and 33 (55%) had less than 10 total organisms ([Table D-9](#)). The dominant organisms present are generally characterized as tolerant of pollutants and low dissolved oxygen, and opportunistic; are indicative of organic enrichment and depositional environments; and are surface dwellers, inhabiting the sediment/water interface (deeper-dwelling organisms were generally low to absent, probably due to anoxic conditions at depths more than a few centimeters below the sediment surface) ([Table D-9](#)). The available benthic invertebrate community data are evaluated in detail as part of the risk characterization (Section D.5.2).

## D.2.2 Analytical Data Used in the Evaluation

Only the surface sediment samples collected in August/September 2010 were used in this evaluation, which were collected from each of the 60 grids within the 2009 preliminary impacted sediment lateral boundary. Sampling locations are shown on [Figure D-1](#). The raw analytical data are provided in [Attachment A](#) of the TM. The number and location of the 2010 samples were scoped jointly by the Navy, USEPA, VDEQ, and the Region 3 BTAG as part of the SAP process.

## D.2.3 Conceptual Model

The conceptual model relates potentially exposed receptor populations with potential source areas based upon physical site characteristics and complete exposure pathways. Important components of the conceptual model are the identification of potential source areas, transport pathways, exposure media, exposure pathways and routes, and receptors. Actual or potential exposures of ecological receptors associated with a site are determined by identifying the most likely, and most important, mechanisms and pathways of contaminant release and transport. A complete exposure pathway has three components: (1) a source of chemicals that results in a release to the environment; (2) a pathway and mechanism of chemical transport through an environmental medium; and (3) an exposure or contact point for an ecological receptor. [Figure D-5](#) illustrates a diagrammatic conceptual model for SWMU 3. Key components of this conceptual model are discussed in the following subsections.

### D.2.3.1 Source Areas

The site-related potential source areas at SWMU 3 include the areas in which historic sandblasting-related activities have occurred.

### D.2.3.2 Transport Pathways and Exposure Media

A transport pathway describes the mechanisms whereby chemicals may be transported from a source of contamination to ecologically relevant media (such as sediment). These transport pathways are shown on [Figure D-5](#).

As discussed in Section D.1.3, the exposure medium for ecological receptors that is relevant to this ERA is limited to sediment. Site-related chemicals in soils may have been transported via direct and/or indirect (via the storm sewer system) surface runoff to Little Creek Harbor. ABM residue may also have been transported via wind to Little Creek Harbor. Site-related chemicals in surface sediment may be taken up and accumulated in the tissue of biota, and thus be transported to upper trophic level receptors via food webs. Based upon the 2005 RI and 2009 SRI, the food web pathway did not result in any unacceptable risks and is not evaluated further.

### D.2.3.3 Exposure Pathways and Routes

An exposure pathway links a source of contamination with one or more receptors through exposure via one or more media and exposure routes. Exposure, and thus potential risk, can only occur if complete exposure pathways exist. [Figure D-5](#) shows the complete exposure pathways to ecological receptors at SWMU 3. The key complete exposure pathway is to the benthic invertebrate community utilizing Little Creek Harbor in the vicinity of SWMU 3 (direct exposure to surface sediments).

An exposure route describes the specific mechanism(s) by which a receptor is exposed to a chemical present in an environmental medium. The most common exposure routes are dermal contact, direct uptake, ingestion, and inhalation. The key exposure route for this evaluation is direct contact with surface sediments (for benthic invertebrates).

### D.2.3.4 Receptors

The key receptors for this evaluation are benthic invertebrates. Various species of estuarine fish may use Little Creek Harbor in the vicinity of SWMU 3, at least periodically, but the duration and magnitude of potential exposures are expected to be limited. Based upon habitat and salinity, amphibians and reptiles are not expected to be significant receptors at this site. Similarly, exposures for upper trophic level receptors (birds and mammals) are not expected to be significant at the site due to the limited habitat along the shoreline (rip-rap or bulkhead), the depth of the water in the Offshore Area, and the results of the food web modeling conducted as part of the 2005 RI (and revisited as part of the 2009 SRI).

### D.2.3.5 Endpoints and Risk Hypotheses

The conclusion of the problem formulation includes the selection of ecological endpoints and risk hypotheses, which are based upon the conceptual model. Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process (USEPA, 1997). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic related to the component or value chosen as the assessment endpoint. The



considerations for selecting assessment and measurement endpoints are summarized in USEPA's *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints define ecological attributes to be protected (assessment endpoints) and measurable characteristics of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals attributable to a site (USEPA, 1997). Assessment endpoints contain an entity (e.g., benthic invertebrate population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or contaminant sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself. Effects on individual organisms are important for some receptors, such as rare and endangered species; population- and community-level effects are typically more relevant to ecosystems. Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of chemical exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level. In addition, use of criteria values designed to protect the majority of the components of a community (e.g., Ambient Water Quality Criteria [AWQC] for the Protection of Aquatic Life) can be useful in evaluating potential community- and/or population-level effects.

**Table D-10** shows the assessment endpoints, risk hypotheses, and measurement endpoints used in the evaluation. **Table D-10** also shows the receptors associated with each endpoint.

## D.3 Exposure Assessment

Concentrations of the metal COCs in the 2010 sediment samples are shown in **Table D-11**. These data constitute the exposure point concentrations for this evaluation.

### D.3.1 Data Groupings

The following spatial groupings were utilized (**Figure D-1**):

- Near Shore Area – samples collected in Little Creek Harbor along the immediate shoreline of SWMU 3 (**Table D-11**).
- Dry Dock – samples collected from grids in the vicinity of the floating dry dock (**Table D-11**).
- Offshore Area – samples collected in Little Creek Harbor in areas away from the immediate shoreline of SWMU 3 (**Table D-11**).
- Marina – samples collected in and around the marina located in the southern portion of SWMU 3 (**Table D-11**).

These spatial groupings were used to better evaluate potential risks in different areas of Little Creek Harbor adjacent to the site where potential exposures could vary due to differences in the magnitude of chemical concentrations. In addition, these groupings assist in the evaluation of the spatial distribution of potential risks in Little Creek Harbor relative to the site.

## D.4 Effects Assessment

The effects assessment defines the methods and data used to define an adverse ecological effect. Effects data, which are reflected in the measurement endpoints, include:

- **Site-specific PRGs** – Analytical sediment data are compared to the sediment PRGs summarized in [Table D-3](#). RQs are also calculated and compared with the decision criteria summarized in Section D.1.1.3.
- **Benthic Invertebrate Surveys** – Results of the benthic invertebrate surveys that were conducted in August/September 2010.
- **Bioavailability Measures** – Additional data were collected to help evaluate the chemical-specific bioavailability for direct exposures to surface sediment (AVS/SEM, TOC, and grain size).

## D.5 Risk Characterization

Risk characterization uses the information from the three previous parts of the ecological risk evaluation (problem formulation, exposure assessment, and effects assessment) to evaluate potential risks/impacts to ecological receptors.

### D.5.1 Comparison with Sediment PRGs

The surface sediment evaluation was conducted using the data groupings discussed in Section D.3.1 and is summarized in [Table D-11](#). A sample meets the decision criteria relating to the sediment PRGs if: (1) visible ABM is less than or equal to 1 percent; (2) the average RQ is less than 1; and (3) no individual RQ exceeds 1.5 (see Section D.1.1.3). For all areas combined, ABM exceeded 1 percent in 24 of 58 samples (two samples did not have data for this parameter), one or both RQ criteria were exceeded in 24 of 60 samples, and both the ABM and RQ criteria were exceeded in 18 of 60 samples. However, the SEM/AVS ratio, a measure of metal bioavailability, exceeded one in only 2 of 60 samples, and only one of these two samples (SD-516, in the Near Shore Area) also failed the ABM and/or the RQ criteria (although the SEM/AVS ratio was only slightly over one [1.10] at SD-516). However, 14 benthic invertebrate taxa were observed at SD-516, with a total density of 560 organisms/m<sup>2</sup>. Both of these values were well above the median value across all 60 grids. Pollution sensitive taxa were also observed at SD-516 (6 total pollution sensitive organisms, among the highest totals observed at the site), comprising about 10 percent of the community. The nearby Near Shore sampling grids SD-523 and SD529, which also failed both the ABM and RQ criteria but had SEM/AVS ratios below one, had similarly high number of taxa and densities, and also contained pollution sensitive taxa ([Table D-9](#)).

None of the 3 samples in the Dry Dock area exceeded either the ABM or the RQ criteria. The average percent ABM was 0.67 and the mean average RQ was 0.76. The lack of exceedances is likely the result of dredging that has occurred in this area in 1999 and 2002. For the Marina, 7 of 11 samples failed the ABM criterion, 5 of 11 samples failed the RQ criteria, and 5 of 11 samples failed both. The average percent ABM was 2.44 and the mean average RQ was 1.10. For the Near Shore Area, 11 of 19 samples failed the ABM criterion, 10 of 19 samples failed the RQ criteria, and 9 of 19 samples failed both. The average percent ABM was 12.3 and the mean average RQ was 3.19. For the Offshore Area, 6 of 25 samples failed the ABM criterion, 9 of 27 samples failed the RQ criteria, and 4 of 27 samples failed both. The average percent ABM was 0.87 and the mean average RQ was 0.98.

### D.5.2 Benthic Invertebrate Surveys

Benthic invertebrate surveys were conducted in 2010 at all 60 grids comprising the project area. 2010 samples were composites of three samples collected around the center point of the sampling grid using a petite Ponar dredge (36 in<sup>2</sup> sampling area); total sampled area was 108 in<sup>2</sup> (3 x 36). Replicate samples (three per sampling grid) were collected from 3 of the 60 sampling grids (534, 550, and 558; [Figure D-1](#)). Each replicate sample consisted of three grabs collected from the same location within the sampling grid (rather than at three different locations within the same sampling grid) and composited. Since each of the three samples (each composed of three grabs from the same location) were collected from within the same sampling grid, but in different areas of the grid, they are replicate samples for that sampling grid.

During the 2010 sampling, organism counts were highly variable but most locations had low numbers of organisms. Of the 60 sampling grids, 14 (23.3%) had zero organisms (for each of the three grids [534, 550, and 558] that had replicate samples, at least one replicate had no organisms; however, the average of the three replicates was used to represent the grid, so none of these grids was considered to have no organisms) and 33

(55%) had less than 10 total organisms ([Table D-9](#)). Total densities ranged from 0 to 2,414 organisms per square meter and number of taxa ranged from 0 to 35. The dominant organisms present at the site are generally characterized as tolerant of pollutants and low dissolved oxygen, and opportunistic; are indicative of organic enrichment and depositional environments; and are surface dwellers, inhabiting the sediment/water interface (deeper-dwelling organisms were generally low to absent, probably due to anoxic conditions at depths more than a few centimeters below the sediment surface). The benthic invertebrate community at the site was dominated by polychaetes, most of which are pollution tolerant. Polychaetes accounted for about 52 percent of the total benthic invertebrate community. Bivalves, the next most numerous group, comprised about 21 percent of the total community. Pollution sensitive organisms were detected in some samples, but were relatively uncommon. About half (31 of 60) of the sampling grids (including the 14 grids with no total organisms) had no pollution sensitive organisms and only 6 sampling grids had more than 5 total pollution sensitive organisms (5 of these 6 sampling grids were in the Near Shore Area). The results from the 2010 replicate samples ([Table D-12](#)) indicate some spatial variability, particularly in sample 534, since the coefficients of variability were, with few exceptions, greater than one (which indicates that the standard deviation, a measure of variability, is greater than the mean value) for the metrics evaluated (see the following section).

#### **D.5.2.1 Correlation Between Benthic Metrics and Physical/Chemical Parameters**

In Section D.1.3, the following environmental question was outlined:

- Is the composition and condition of the existing benthic invertebrate community at SWMU 3 correlated with the concentration of the COCs and/or the presence of ABM?

In this section, a statistical evaluation of the 2010 benthic invertebrate data is conducted in order to answer this question. During the December 2010 Partnering team meeting, the Navy, USEPA, and VDEQ agreed to include the following benthic invertebrate metrics in the statistical evaluation:

- Number of taxa (taxa richness)
- Total density
- Percent contribution of dominant taxon
- Density of dominant taxon
- Percent Spionid polychaetes
- Percent Mediomastus and Capitella polychaetes
- Density of pollution tolerant organisms
- Percent pollution tolerant organisms
- Density of pollution sensitive organisms
- Percent pollution sensitive organisms

However, because of the relatively large number of sampling grids with zero organisms (14 of 60 or 23.3 percent), only number of taxa and total density were used in the statistical evaluation. Zero counts always yield meaningful values for these metrics, which is not always true for the other eight metrics. A zero value for number of taxa and total density means that no organisms were present, a meaningful result. However, if a sample contains no organisms (and is therefore presumed to be impacted), it has an undefined value for any of the parameters based upon a percentage (since you are dividing by zero). The sample would also have a value of zero for density of the dominant taxon and density of pollution tolerant organisms; low values for these two parameter suggest a healthy, not an impacted, community.

As part of the statistical evaluation, total density and number of taxa are examined for correlations with the physical and chemical parameters of the surface sediments and the bottom of the water column. These parameters include, for surface sediment, the concentrations of the COCs, grain size, TOC, pH, SEM/AVS ratio, and percent ABM, and, for the water column (measured just above the sediment surface), dissolved oxygen, ORP, salinity, temperature, specific conductivity, turbidity, and pH. Average RQ and water depth were also included as variables.

As agreed to at the December 2010 Partnering Team meeting, the values for the following metrics are reported but not included in the statistical evaluation:

- Diversity (Shannon-Weiner Index)
- Percent amphipods
- Percent bivalves
- Percent deposit feeders

These four metrics were included on the preliminary list of metrics in the SAP but were proposed for deletion at the December 2010 Partnering Team meeting, because they were not useful metrics based on a review of the benthic invertebrate data. At the December 2010 Partnering Team meeting, when the metrics were finalized, BTAG requested that these four metrics be reported (not deleted); however, the Tier I Partnering Team agreed that they need not be included in the statistical analysis. The values for these metrics, as well as for the 10 primary metrics, are shown in [Table D-9](#). For the three samples with replicates, the mean value was used in the statistical evaluation to represent the sample. The “pollution classification” for each taxa is also listed in [Table D-9](#), if available. Since not all taxa had classifications, the sum of the percent pollution sensitive organisms and the percent pollution tolerant organisms do not always add up to 100. For example, SD501 is comprised of 21.7 percent pollution tolerant organisms and 8.33 percent pollution sensitive organisms (the remainder had no available classifications). Values for average RQ are shown in [Table D-11](#).

Both statistical and observational methods were used to identify chemical and/or physical parameters that were potentially associated (correlated) with differences in the values of the benthic invertebrate metrics.

Observational methods included examination of scatterplots for each benthic metric with each physical and chemical parameter. Correlations (linear) were investigated statistically using both parametric (Pearson product-moment) and non-parametric (Spearman rank) correlation coefficients. Pearson correlation coefficients (which use the actual data values) are more influenced by outliers, unequal variances, non-normality, and nonlinearities than are Spearman-rank correlation coefficients (which use ranks and not the actual data values themselves).

Because the data were rarely normally distributed, an assumption of the Pearson statistic (the Spearman statistic does not have any distribution assumptions), the Spearman coefficients were given more weight if the results of the two methods differed. The significance level ( $\alpha$ ) was set at 0.05 for both tests.

[Figure D-6](#) shows scatterplots of each benthic metric with each physical and chemical parameter. Correlation coefficients are summarized in [Table D-13](#). [Table D-14](#) lists only the significant correlations. Number of taxa had 18 significant correlations (out of 25 possibilities) with the physical and chemical parameters based upon the Spearman test. These correlations were relatively weak, with very few  $R^2$  values (these values indicate the proportion of the variability explained, a measure of the strength of the relationship) above 0.50. Total density had 19 significant correlations (out of 25 possibilities) with the physical and chemical parameters based upon the Spearman test. These correlations were relatively weak, with very few  $R^2$  values above 0.50. Silt/clay had the strongest correlations (maximum  $R^2$  of 0.620) based upon the Spearman test (several other grain size fractions were also significantly correlated with the benthic metrics but not as strongly as silt/clay), followed by water depth (maximum  $R^2$  of 0.562), bottom dissolved oxygen (DO) (maximum  $R^2$  of 0.342), and TOC (maximum  $R^2$  of 0.290) ([Table D-14](#)). The metal COCs were not significantly correlated with either benthic metric based upon the Spearman test (copper, nickel, and zinc), or were only weakly correlated (tin and zinc). Average RQ was also not significantly correlated with either benthic metric.

Based upon the results of the individual correlations, multiple regression analysis was conducted for number of taxa and total density. These two benthic metrics were significant positively correlated with one another ([Table D-15](#)), with a  $R^2$  value of 0.956.

The physical and chemical parameters (silt/clay, total organic carbon, water depth, and bottom dissolved oxygen) that had the highest individual correlations with the benthic invertebrate metrics ([Figures D-7 through D-14](#)) were included in the multiple regression analysis. Average RQ and percent ABM were also included because they represented the PRG decision metrics; average RQ was not significantly correlated with either benthic metric based upon the Spearman test and percent ABM was only weakly (but significantly) correlated (maximum  $R^2$  of

0.180) (Figures D-15 through D-18). Table D-15 shows the correlations among these six physical and chemical parameters. Based upon the Spearman test, average RQ was only significantly correlated with percent ABM (positive). Percent ABM was significantly correlated with average RQ (positive), silt/clay (negative), and water depth (negative). Silt/clay was significantly correlated with percent ABM (negative), TOC (positive), bottom DO (negative), and water depth (positive). TOC was significantly correlated with silt/clay (positive), bottom DO (negative), and water depth (positive). Bottom DO was significantly correlated with silt/clay (negative), TOC (negative), and water depth (negative). Water depth was significantly correlated with percent ABM (negative), silt/clay (positive), TOC (positive), and bottom DO (negative). Although statistically significant, most of these correlations were relatively weak, with very few  $R^2$  values above 0.50. This indicates that each of these parameters did not co-vary strongly with any other parameter. Thus, there are no redundancies among this set of six parameters for the purposes of multiple regression analysis (pairs of highly correlated variables would be redundant in a multiple regression model if both were included).

The results of the multiple regression are summarized in Table D-16. Four variations of multiple regression were employed, as follows:

- Stepwise – the stepwise method removes and adds variables (physical/chemical parameters) to the model in a series of steps to identify those parameters that are most useful in predicting the response variable (benthic metric). Variables accepted in earlier steps can be removed in later steps if they are no longer significant.
- Forward – the forward method adds variables to the model one at a time and retains them if they are useful (significant). Unlike the stepwise method, variables cannot be removed once they are added to the model.
- Backward – the backward method begins with all variables included in the model and removes them one at a time until all remaining variables are significant. Once removed, a variable cannot re-enter the model.
- None – this method employs no variable selection mechanism. All variables are included (forced into the model) regardless of their usefulness (significance).

The significance level ( $\alpha$ ) was set at 0.05 for all tests.

For number of taxa, silt/clay, water depth, and average RQ were the variables that were most consistently important to the models. The resulting model containing these three variables was a relatively good predictor, with an adjusted  $R^2$  value of 0.610 (the adjusted  $R^2$  accounts for having multiple variables in the model [including the intercept term] whereas  $R^2$  does not). Water depth, which was correlated with bottom DO (Figure D-19), was selected preferentially by the model although bottom DO also entered the forward model (but was not significant in the final model). Of interest, average RQ was consistently an important variable in the model even though its individual correlation to number of taxa was not significant. Further, the sign of its contribution to the model was positive, meaning that higher values for number of taxa were associated with higher average RQ values.

For total density, silt/clay and average RQ were the variables most consistently important to the models. The resulting model containing these two variables, however, was a poor predictor, with an adjusted  $R^2$  value of 0.422. Bottom DO also entered the forward model (but was not significant in the final model). Of interest, average RQ was consistently an important variable in the model even though its individual correlation to total density was not significant. Further, the sign of its contribution to the model was positive, meaning that higher values for total density were associated with higher average RQ values.

In summary, silt/clay and average RQ were the best predictors of the benthic invertebrate metrics, along with water depth and, to a lesser extent, bottom DO. However, average RQ was positively correlated with the metrics. Silt/clay was negatively correlated with the metrics, suggesting that depositional areas with high silt/clay content (and likely organic loading) were detrimental to the benthic invertebrate community. Water depth was also negatively correlated with the metrics while bottom DO was positively correlated. Thus, shallower waters with less deposition had higher levels of DO, allowing a relatively “healthier” benthic invertebrate community to occur, as measured by the benthic metrics evaluated. Conversely, these areas were generally along the site shoreline and thus tended to have higher concentrations of metals and ABM, which is why these variables were positively correlated with the benthic metrics. Based upon these data, the physical factors (such as bottom DO) had more



effect on the benthic invertebrate community than the chemical factors related to the site. This may be due to limited metal bioavailability as the SEM/AVS ratios were almost always less than one. Thus, low DO at the bottom of the water column (just above the sediment surface) appears to have a major impact on the benthic community. This condition is not uncommon in urban harbors with high organic loading in the Chesapeake Bay system, particularly in summer (July and August) when the amount of oxygen the water column can hold, which decreases as water temperature increases, is at a minimum. Freshwater inflow carrying nutrients (primarily nitrogen and phosphorus) from agricultural and urban runoff, wastewater systems, and atmospheric deposition stimulates the growth of phytoplankton/algae, which later die and sink to the bottom of the water column, where their decomposition by bacteria consumes much of the oxygen from the bottom of the water column (which is why TOC is typically negatively correlated with bottom dissolved oxygen concentrations). This process can be exasperated in deeper waters as water column stratification can develop based upon differences in water temperature and salinity (increases in salinity also reduce the amount of oxygen the water can hold) with depth, isolating the deeper waters from the more oxygenated (through diffusion with the air, wind action, and wave/tidal action) surface layers. Based upon [Figures D-7 and D-8](#), a bottom DO of 4 mg/L is an approximate “threshold”, at the water temperature and salinity present at the time of sampling, below which impacts to the benthic invertebrate community appear to be most acute at this site. However, since water temperature, and to a lesser extent salinity, vary temporally, this “threshold” cannot be extrapolated to other periods of the year; however, it is a useful qualitative measure for the spatial evaluation of the 2010 data set.

### D.5.2.2 Spatial Analysis

In Section D.1.3, the following environmental question was outlined:

- What is the composition and condition of the existing benthic invertebrate community at SWMU 3 and how does it vary spatially throughout the site?

In this section, a statistical evaluation of the 2010 benthic invertebrate data is conducted in order to answer this question. The composition and condition of the benthic invertebrate community was described at the beginning of Section D.5.2.

For each benthic metric, an analysis of variance (ANOVA) was conducted to determine if any differences existed among 2010 area (Dry Dock, Near Shore, Marina, and Offshore) means. The ANOVA is a parametric test, and thus assumes normality and homogeneity of variances, assumptions that were often not met. Thus, the non-parametric Kruskal-Wallis ANOVA on ranks was also conducted on the medians of the response variables (benthic metrics). This non-parametric method offers a more consistent view of the data since all cases can be treated the same regardless if they support an assumption of normality or not. If the ANOVA was significant (i.e., differences in mean or median values among the areas were greater than would be expected by chance), then pair-wise comparisons were conducted to isolate the area or areas that differed from the others. Tukey’s procedure was the multiple comparison procedure used, both for the ANOVA and (using ranks) for the Kruskal-Wallis ANOVA. If the ANOVA was not significant, no pair-wise comparisons were made, as it was concluded that there were no significant differences among the areas. The significance level ( $\alpha$ ) was set at 0.05 for all tests.

[Table D-17](#) summarizes the results of the statistical analysis. For each metric or parameter, the group with the largest mean value was assigned the letter A in [Table D-17](#). If the mean value in all areas was statistically similar to one another, then all areas were assigned the letter A. If the mean value of an area was statistically lower than the one designated as A, then it was designated as B. If the mean value was statistically lower in the third area, then it was designated as C, and, in the fourth area, the letter D. If the mean was not statistically different between two different areas (A or B), it was given the designation AB. Thus, an area designated as AB lies between two areas significantly different from each other, but the AB area is not significantly different from either. Area-specific correlations are shown in [Table D-18](#).

Number of taxa and total density showed identical spatial patterns. The highest values of these metrics were found in the Near Shore Area, followed by the Marina (which did not differ significantly from the Near Shore Area), the Offshore Area (which differed from the Near Shore Area but not the Marina), and the Dry Dock (which differed from the Near Shore Area and Marina but not the Offshore Area). Thus, total density and number of taxa

were highest in the Near Shore Area and most of the Marina, were zero in the immediate vicinity of the Dry Dock, and were typically very low in the Offshore Area. This distribution does not match well with metal or ABM concentrations, suggesting that other factors (such as low DO) may be as or more important to survival of benthic invertebrates. As discussed in Section D.5.2.1, a bottom DO of 4 mg/L is an approximate “threshold”, at the water temperature and salinity present at the time of sampling, below which impacts to the benthic invertebrate community appear to be most acute. Bottom DO exceeds this value in most Near Shore (with two exceptions; one next to the Dry Dock and one in the southern portion of the site) and Marina grids. Bottom DO does not exceed this value in any Dry Dock grid and in about half of the Offshore Area grids ([Figure D-20](#)). Bottom DO is also negatively correlated with water depth; deepest water was generally observed in the Dry Dock and Offshore Area ([Figure D-21](#)).

Because a reference area was not sampled for benthic invertebrates, values for the two benthic invertebrate metrics used in the SWMU 3 evaluation (number of taxa and total density) were qualitatively compared among the spatial areas of the site ([Figures D-22 and D-23](#)). Values for these metrics were generally highest in the Near Shore and Marina Areas (where metals concentrations and ABM were typically highest) and lowest in the Offshore and Dry Dock Areas (where metals concentrations and ABM were typically lowest). Although the area in the vicinity of the Dry Dock has been dredged as recently as 2002, sufficient time has passed for the benthic community to become reestablished. It appears that physical factors, such as low bottom DO levels and water depth, may be preventing this from occurring since metal concentrations and ABM levels are below remediation criteria. Routine activities associated with Dry Dock activities, such as prop wash from tug boats and operation of the Dry Dock pumps, may also be a factor.

### D.5.3 Risk Evaluation

In Section D.1.3, the following environmental question was outlined:

- What action is required at SWMU 3 to meet the preliminary RAO and what is the spatial extent of such an action?

In this section, the results for the lines of evidence evaluated are integrated to answer this question. The other two environmental questions from the SAP were evaluated in the previous section.

Because a suitable reference area was not sampled, there is insufficient data to fully evaluate the preliminary RAO (to allow a benthic invertebrate community consistent with the urban nature of Little Creek Harbor to become established) since a quantitative measure of a benthic invertebrate community consistent with the urban nature of Little Creek Harbor (but unaffected by SWMU 3) is unavailable. However, the portion of the site with the highest concentrations of metals and ABM (Near Shore Area and portions of the Marina) typically has the most developed benthic invertebrate community relative to other areas of the site (Dry Dock and Offshore Areas), where metals concentrations and ABM are typically lower. This may be due to limited metal bioavailability, as the SEM/AVS ratios were almost always less than one in 2010 samples (for 58 of 60 grids). Although AVS may vary seasonally, the 2010 data, collected in late summer when DO levels are typically lowest and organisms are typically most stressed, may be the most relevant data on a seasonal basis. None of the Dry Dock samples, and very few of the Offshore Area samples, fail both the percent ABM and RQ criteria. The impacts to the benthic invertebrate community in these areas appear to be related to physical factors not associated with SWMU 3 (such as water depth and bottom DO concentrations). Since ABM is essentially inert (based upon grain size analysis, ABM appears predominantly in the coarse sand fraction; the “black beauty” materials consist mainly of silicon dioxide [sand], aluminum oxide, iron oxide, and calcium oxide) and the metals in the paint residues do not decay (since they are elements, although they may change chemical form based upon ambient environmental conditions) and increase sediment oxygen demand, these site-related factors do not contribute to reduced DO levels at the bottom of the water column. Although the current, non-CERCLA-related physical characteristics of the site (such as bottom DO concentrations) may be having more of an impact on the condition of the benthic invertebrate community than the CERCLA-related metals detected in site sediments (due to bioavailability considerations), the magnitude of these metals concentrations may potentially result in unacceptable risks to ecological receptors should these physical characteristics change over time; therefore, remedial action at SWMU

3 is warranted. Given the current physical limitations in the Dry Dock and Offshore Areas (primarily low bottom DO concentrations), it is unlikely that a benthic invertebrate community that would approach that in a similar urban reference area would be established following remedial action; therefore, the remedial action objectives established for the site should focus on the reduction of metals concentrations and not the establishment of a comparable (to an urban reference condition) benthic invertebrate community.

#### D.5.4 Risk Conclusions and Recommendations

Based upon the regression analysis, silt/clay and average RQ were the best predictors of the benthic invertebrate metrics, along with water depth and, to a lesser extent, bottom DO. However, average RQ was positively correlated with the metrics. Silt/clay was negatively correlated with the metrics, suggesting that depositional areas with high silt/clay content (and likely organic loading) were detrimental to the benthic invertebrate community. Water depth was also negatively correlated with the metrics while bottom DO was positively correlated. Thus, shallower waters with less deposition had higher levels of DO, allowing a relatively “healthier” benthic invertebrate community to occur, as measured by the benthic metrics evaluated. Conversely, these areas were generally along the site shoreline and thus tended to have higher concentrations of metals and ABM. Based upon these data, the physical factors (such as bottom DO) had more effect on the benthic invertebrate community than the chemical factors related to the site. This may be due to limited metal bioavailability as the SEM/AVS ratios were almost always less than one in 2010 samples (for 58 of 60 grids). Although AVS may vary seasonally, the 2010 data, collected in late summer when DO levels are typically lowest and organisms are typically most stressed, may be the most relevant data on a seasonal basis.

The portion of the site with the highest concentrations of metals and ABM (Near Shore Area and portions of the Marina) typically has the most developed benthic invertebrate community relative to other areas of the site (Dry Dock and Offshore Areas), where metals concentrations and ABM are typically lower. None of the Dry Dock samples, and very few of the Offshore Area samples, fail both the percent ABM and RQ criteria. The impacts to the benthic invertebrate community in these areas appear to be related to physical factors not associated with SWMU 3 (such as water depth and bottom DO concentrations). Since ABM is essentially inert (based upon grain size analysis, ABM appears predominantly in the coarse sand fraction; the “black beauty” materials consist mainly of silicon dioxide [sand], aluminum oxide, iron oxide, and calcium oxide) and the metals in the paint residues do not decay (since they are elements, although they may change chemical form based upon ambient environmental conditions) and increase sediment oxygen demand, these site-related factors do not contribute to reduced DO levels at the bottom of the water column.

Although the current, non-CERCLA-related physical characteristics of the site (such as bottom DO concentrations) may be having more of an impact on the condition of the benthic invertebrate community than the CERCLA-related metals detected in site sediments (due to bioavailability considerations), the magnitude of these metals concentrations may potentially result in unacceptable risks to ecological receptors should these physical characteristics change over time; therefore, remedial action at SWMU 3 is warranted. Given the current physical limitations in the Dry Dock and Offshore Areas (primarily low bottom DO concentrations), it is unlikely that a benthic invertebrate community that would approach that in a similar urban reference area would be established following remedial action; therefore, the remedial action objectives established for the site should focus on the reduction of metals concentrations and not the establishment of a comparable (to an urban reference condition) benthic invertebrate community.

## D.6 References for Attachment D

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TABLE D-1

Unvalidated Background Surface Sediment Data From Little Creek Cove - July 2007

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Constituent	LREF-SD401 7/5/2007	LREF-SD402 7/5/2007	LREF-SD404 7/5/2007	LREF-SD406 7/5/2007	LREF-SD407 7/5/2007	LREF-SD408 7/5/2007	LREF-SD409 7/5/2007	LREF-SD409P 7/5/2007	LREF-SD410 7/5/2007
<b>Total Metals (MG/KG)</b>									
Copper	174	184	110	155	152	161	128	154	150
Lead	50.2 *	67.6 *	37.7 *	50.3 *	38.6 *	40.4 *	34.7 *	40.4 *	36.3 *
Mercury	0.088 *	0.16 *	0.13 *	0.17 *	0.20 *	0.16 *	0.15 *	0.18 *	0.15 *
Nickel	18.3	22.7	21.9	25.8	26.5	25.5	21.2	24.8	19.8
Tin	6.80	8.80	9.50	9.00	9.80	9.20	7.20	9.00	6.80
Zinc	241 *	421 *	229 *	307 *	281 *	288 *	242 *	287 *	264 *
<b>Other Parameters</b>									
pH	7.50	8.20	8.10	8.00	7.90	8.10	8.20	7.90	8.10
Total organic carbon (MG/KG)	78,000	39,000	34,000	47,000	41,000	39,000	42,000	40,000	31,000
Percent fines	75.2	91.6	65.1	94.3	91.7	92.9	91.4	NA	79.2
<b>AVS/SEM (UMOL/G)</b>									
Acid volatile sulfide	NA	5.4	NA	NA	7.4	NA	0.5 U	12	NA
Cadmium	NA	0.0057 U	NA	NA	0.0057 U	NA	0.0053 U	0.0053 U	NA
Copper	NA	0.33	NA	NA	0.86	NA	0.016 U	0.11	NA
Lead	NA	0.14	NA	NA	0.14	NA	0.0048 U	0.11	NA
Mercury	NA	0.00011 U	NA	NA	0.0001 U	NA	0.0001 U	0.0016	NA
Nickel	NA	0.062	NA	NA	0.075	NA	0.017 U	0.055	NA
Zinc	NA	3.4	NA	NA	2.9	NA	0.03 U	2.6	NA

Shaded cells indicate detected values

NA - Not Analyzed

\* = The matrix spike duplicate was outside of the control limits

**TABLE D-2**

ABM Regression Equations, Site-Specific Background Values, and Literature-Based Sediment Effect Levels for SWMU 3 Sediment COCs

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Chemical	Regression Equation <sup>a</sup>					ER-L	ER-M	TEL	PEL	Mean Background	Maximum Background
	m	B	R <sup>2</sup>	p	1% ABM						
Primary COCs (MG/KG)											
Copper	10.66	221.7	0.67	<0.01	232	34.0	270	18.7	108	155	184
Lead	8.54	98.9	0.73	<0.01	107	46.7	218	30.2	112	45.2	67.6
Nickel	1.64	24.5	0.45	<0.01	26.2	20.9	51.6	15.9	42.8	23.2	26.5
Tin	2.10	9.07	0.77	<0.01	11.2	--	--	--	--	8.61	9.80
Zinc	29.28	424.5	0.59	<0.01	454	150	410	124	271	290	421
Secondary Factors (MG/KG)											
Mercury	--	--	--	--	--	0.15	0.71	0.13	0.70	0.15	0.20
Total PAHs	--	--	--	--	--	4.02	44.8	1.68	16.8	--	--
	--	--	--	--	--			5.95 <sup>b</sup>	36.9 <sup>c</sup>	--	--

Shaded cells indicate the selected PRG or qualitative assessment factor (for secondary chemicals)

a - Concentration = m • (ABM) + B. For example, the tin concentration = 2.10 • 1 + 9.07 = 11.2

b - TEC (2.05% TOC)

c - MEC (2.05% TOC)

**TABLE D-3**

Sorted Values for ABM Regression (1% ABM) , Site-Specific Background, and Literature-Based Sediment Effect Levels - SWMU 3 Sediment COCs

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Copper			Lead			Nickel			Tin			Zinc	
TEL	18.7		TEL	30.2		TEL	15.9		Mean Background	8.61		TEL	124
ER-L	34.0		Mean Background	45.2		ER-L	20.9		Max Background	9.80		ER-L	150
PEL	108		ER-L	46.7		Mean Background	23.2		<b>1% ABM</b>	11.2		PEL	271
Mean Background	155		Max Background	67.6		<b>1% ABM</b>	26.2		ER-L	NA		Mean Background	290
Max Background	184		<b>1% ABM</b>	107		Max Background	26.5		ER-M	NA		ER-M	410
<b>1% ABM</b>	232		PEL	112		PEL	42.8		TEL	NA		Max Background	421
ER-M	270		ER-M	218		ER-M	51.6		PEL	NA		<b>1% ABM</b>	454

Shaded cells indicate the selected PRG

**TABLE D-4**

2002 and 2007 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Station	Depth	Date	Dissolved Oxygen (mg/L)	ORP (MV)	pH	Salinity (ppt)	Specific Conductivity (ms/cm)	Temperature (C)	Turbidity (NTU)
LW03-A-SD201	Surface	10/3/2002	12.6	65	6.60	19.3	29.8	27.0	0
LW03-A-SD201	Subsurface	10/3/2002	13.2	65	6.61	20.0	31.7	27.1	0
LW03-A-SD202	Surface	10/4/2002	11.0	65	6.30	14.4	12.7	24.9	0
LW03-A-SD202	Subsurface	10/4/2002	11.5	-163	8.35	16.0	28.1	25.1	0
LW03-B-SD201	Surface	10/2/2002	12.6	59	6.27	19.1	30.5	26.1	0
LW03-B-SD201	Subsurface	10/2/2002	13.5	61	6.24	19.1	30.5	26.1	0
LW03-B-SD202	Surface	10/3/2002	11.4	222	5.84	20.1	31.7	25.0	0
LW03-B-SD202	Subsurface	10/3/2002	11.5	2.04	6.35	20.4	32.4	24.7	600
LW03-C-SD201	Surface	10/2/2002	10.8	148	5.93	19.5	31.1	25.7	0
LW03-C-SD201	Subsurface	10/2/2002	11.1	1.47	5.93	19.9	31.7	25.1	25.1
LW03-C-SD202	Surface	10/2/2002	12.8	139	6.12	18.6	29.9	26.0	0
LW03-C-SD202	Subsurface	10/2/2002	9.15	-134	8.26	19.7	31.4	24.3	0
LW03-D-SD201	Surface	10/2/2002	8.90	2.17	5.28	18.3	29.6	23.8	0
LW03-D-SD201	Subsurface	10/2/2002	8.18	2.10	5.58	19.7	31.1	24.2	0
LW03-D-SD202	Surface	10/2/2002	9.30	173	5.96	19.3	31.2	24.4	0
LW03-D-SD202	Subsurface	10/2/2002	8.92	-86	8.12	19.9	31.3	24.1	0
LW03-E-SD201	Surface	10/3/2002	13.6	10	6.91	20.3	32.3	26.4	0
LW03-E-SD201	Subsurface	10/3/2002	13.5	15	6.81	20.6	32.6	25.4	0
LW03-E-SD202	Surface	10/3/2002	11.3	74	6.18	16.3	26.4	25.2	0
LW03-E-SD202	Subsurface	10/4/2002	4.26	-320	10.1	13.6	22.0	24.6	0
LW03-E1-SD202	Surface	10/3/2002	10.3	191	5.35	15.9	26.4	25.1	0
LW03-E1-SD202	Subsurface	10/4/2002	9.07	-224	9.37	17.4	27.7	24.4	0
LW03-F-SD201	Surface	10/4/2002	12.1	50	6.14	15.5	25.0	26.5	0
LW03-F-SD201	Subsurface	10/4/2002	11.9	-162	7.75	17.6	28.3	25.2	0
LW03-F-SD202	Surface	10/4/2002	12.6	42	6.16	16.8	26.9	26.0	0
LW03-F-SD202	Subsurface	10/4/2002	11.4	-215	8.58	17.6	28.5	24.8	0
LW03-G-SD201	Surface	10/4/2002	11.6	-220	8.35	14.4	23.6	25.8	0
LW03-G-SD201	Subsurface	10/4/2002	24.8	-305	9.05	16.6	27.1	24.8	0
LW03-G-SD202	Surface	10/4/2002	NA	-1.00	6.11	16.8	27.1	25.8	0
LW03-G-SD202	Subsurface	10/4/2002	10.8	-7.00	6.20	17.9	28.8	24.6	13.4
LW03-SD201	Surface	10/3/2002	9.91	1.52	6.37	20.0	32.0	25.5	0

**TABLE D-4**

2002 and 2007 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Station	Depth	Date	Dissolved Oxygen (mg/L)	ORP (MV)	pH	Salinity (ppt)	Specific Conductivity (ms/cm)	Temperature (C)	Turbidity (NTU)
LW03-SD201	Subsurface	10/3/2002	9.98	148	6.39	20.8	32.5	25.3	95.6
LW03-SD204	Surface	10/3/2002	11.3	147	6.58	20.8	33.0	25.0	0
LW03-SD204	Subsurface	10/3/2002	11.0	-133	9.10	14.8	22.6	24.6	0
LW03-SD205	Surface	10/3/2002	26.2	62	6.97	20.2	30.8	26.2	0
LW03-SD205	Subsurface	10/3/2002	9.42	-294	9.99	16.5	26.6	24.2	0
LW03-SD206	Surface	10/3/2002	12.8	147	6.64	19.7	31.2	26.1	0
LW03-SD206	Subsurface	10/3/2002	12.2	-112	8.98	20.4	32.5	24.6	0
LW03-C2-SD301	Surface	2/20/2007	11.9	28	7.89	19.0	19.0	4.30	130
LW03-C2-SD301	Middle	2/20/2007	11.0	-49	7.67	21.0	21.0	4.31	--
LW03-C2-SD301	Bottom	2/20/2007	10.8	-31	7.75	21.0	21.0	4.77	--
LW03-C2-SD302	Surface	2/20/2007	11.4	86	8.59	21.0	21.0	3.98	260
LW03-C2-SD302	Middle	2/20/2007	11.1	79	8.45	22.0	21.0	3.88	320
LW03-C2-SD302	Bottom	2/20/2007	11.0	72	8.27	22.0	21.0	3.71	330
LW03-D-SD329	Surface	2/22/2007	14.1	211	8.13	22.0	37.6	4.91	43
LW03-D-SD329	Middle	2/22/2007	12.9	218	8.06	23.0	37.6	4.33	56
LW03-D-SD329	Bottom	2/22/2007	11.1	225	8.02	23.0	38.1	4.40	93
LW03-D-SD330	Surface	2/22/2007	13.8	74	8.09	22.0	36.9	4.67	19
LW03-D-SD330	Middle	2/22/2007	13.5	63	8.05	23.0	37.9	4.37	22
LW03-D-SD330	Bottom	2/22/2007	12.1	25	7.94	23.0	38.4	4.41	49
LW03-F2-SD303	Surface	2/21/2007	9.59	2	8.73	21.0	20.0	4.74	160
LW03-F2-SD303	Middle	2/21/2007	6.81	-38	8.60	22.0	21.0	3.77	170
LW03-F2-SD303	Bottom	2/21/2007	4.48	-103	8.33	28.0	29.0	6.73	--
LW03-F2-SD305	Surface	2/21/2007	11.2	78	8.87	21.0	20.0	4.39	150
LW03-F2-SD305	Middle	2/21/2007	11.0	77	8.82	30.0	21.0	3.78	--
LW03-F2-SD305	Bottom	2/21/2007	11.0	75	8.79	22.0	21.0	3.70	--
LW03-F2-SD306	Surface	2/21/2007	11.4	-144	8.01	20.0	20.0	4.40	250
LW03-F2-SD306	Middle	2/21/2007	11.0	-162	8.01	20.0	20.0	4.38	410
LW03-F2-SD306	Bottom	2/21/2007	10.9	-160	8.11	21.0	21.0	4.54	480
LW03-G-SD331	Surface	2/23/2007	13.7	14	7.77	22.0	36.7	4.55	--
LW03-G-SD331	Middle	2/23/2007	14.1	18	7.75	22.0	37.0	4.41	--
LW03-G-SD331	Bottom	2/23/2007	12.0	28	7.70	23.0	37.6	4.42	--

**TABLE D-4**

2002 and 2007 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Station	Depth	Date	Dissolved Oxygen (mg/L)	ORP (MV)	pH	Salinity (ppt)	Specific Conductivity (ms/cm)	Temperature (C)	Turbidity (NTU)
LW03-G-SD333	Surface	2/23/2007	12.4	133	8.12	22.0	36.8	4.53	--
LW03-G-SD333	Middle	2/23/2007	12.2	133	8.10	22.0	36.9	4.54	--
LW03-G-SD333	Bottom	2/23/2007	11.5	133	8.01	23.0	37.9	4.46	--
LW03-H-SD307	Surface	2/21/2007	11.5	76	8.76	20.0	20.0	4.62	--
LW03-H-SD307	Middle	2/21/2007	11.2	71	8.70	20.0	20.0	4.30	--
LW03-H-SD307	Bottom	2/21/2007	11.0	61	8.68	21.0	20.0	3.93	--
LW03-H-SD312	Surface	2/21/2007	12.1	170	8.77	19.0	19.0	5.24	--
LW03-H-SD312	Middle	2/21/2007	11.7	171	8.62	19.0	19.0	4.45	--
LW03-H-SD312	Bottom	2/21/2007	11.3	173	8.41	20.0	20.0	4.31	--
LW03-H-SD316	Surface	2/21/2007	12.8	102	9.13	19.0	19.0	5.36	--
LW03-H-SD316	Middle	2/21/2007	12.0	96	9.03	20.0	19.0	4.31	--
LW03-H-SD316	Bottom	2/21/2007	11.2	83	8.93	20.0	20.0	4.30	--
LW03-I-SD317	Surface	2/22/2007	12.8	105	9.13	19.0	19.0	5.62	--
LW03-I-SD317	Middle	2/22/2007	12.6	99	9.09	19.0	19.0	5.31	--
LW03-I-SD317	Bottom	2/22/2007	12.1	88	9.04	20.0	19.0	4.39	--
LW03-I-SD319	Surface	2/22/2007	11.9	104	9.18	17.0	17.0	5.13	--
LW03-I-SD319	Middle	2/22/2007	11.5	99	9.15	19.0	19.0	4.50	--
LW03-I-SD319	Bottom	2/22/2007	11.2	94	8.91	20.0	20.0	4.48	--
LW03-I-SD323	Surface	2/22/2007	11.9	91	9.26	20.0	20.0	5.32	5
LW03-I-SD323	Middle	2/22/2007	10.9	84	8.91	21.0	21.0	4.59	150
LW03-I-SD323	Bottom	2/22/2007	10.3	71	8.88	22.0	21.0	4.43	710
LW03-I-SD326	Surface	2/22/2007	15.1	141	8.09	22.0	36.1	5.16	36
LW03-I-SD326	Middle	2/22/2007	13.0	135	7.96	23.0	38.0	4.39	37
LW03-I-SD326	Bottom	2/22/2007	10.8	118	7.81	23.0	38.7	4.31	71

**TABLE D-5**

2010 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample ID	Date	Depth (feet)	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (ms/cm)	Turbidity (NTU)	ORP (mV)	Salinity (ppt)
LW03-SD501-00-10C	9/2/2010	0.88	7.88	26.21	6.52	37.15	2.3	-27.9	20.65
		2.3	7.84	26.60	5.90	38.29	2.4	-15.2	24.92
		4.3	7.85	26.55	5.78	39.48	4.6	-9.5	25.10
LW03-SD502-00-10C	9/2/2010	0.8	7.91	26.51	7.04	38.25	3.2	66.7	24.61
		4.7	7.83	26.38	5.43	39.74	3.5	69.5	25.30
		7.7	7.75	26.23	4.48	40.02	7.3	69.4	25.42
LW03-SD503-00-10C	9/2/2010	0.6	7.92	26.56	7.11	36.06	2.9	79.8	22.85
		1.6	7.82	26.75	5.75	39.11	3.8	81.3	24.86
		3.7	7.76	26.64	4.54	39.50	5.7	80.4	25.13
LW03-SD504-00-10C	8/31/2010	0.9	7.89	26.10	6.65	38.66	2.7	75.7	24.33
		9.4	7.81	26.19	5.66	40.02	3.3	78.1	25.49
		16.3	7.73	26.08	0.78	40.28	8.8	-102.9	25.70
LW03-SD504A-00-10C	8/31/2010	0.9	7.85	26.56	6.30	39.01	1.8	155.2	24.73
		6.3	7.84	26.40	5.84	39.61	3.1	158.6	25.20
		11.5	7.77	26.13	4.35	40.18	9.7	163.4	25.63
LW03-SD505-00-10C	8/31/2010	0.5	7.89	25.84	6.89	36.67	2.8	23.8	22.48
		6.5	7.86	26.41	5.97	39.61	2.3	35.3	25.25
		13.4	7.81	26.09	5.09	40.31	4.6	37.0	25.71
LW03-SD506-00-10C	9/10/2010	1.0	7.83	25.12	6.15	35.69	1.9	150.9	22.64
		6.7	7.81	25.75	5.59	38.30	4.9	151.1	24.29
		12.6	7.81	25.56	5.34	38.25	6.5	150.8	24.27
LW03-SD507-00-10C	9/2/2010	0.6	7.89	26.65	6.78	38.46	3.3	83.4	24.46
		4.8	7.82	26.38	5.51	39.61	4.1	84.4	25.22
		7.8	7.75	26.30	4.51	39.90	6.0	84.3	25.43
LW03-SD508-00-10C	9/10/2010	0.9	7.93	25.69	7.58	34.27	2.9	141.5	21.58
		3.1	7.89	25.97	6.68	37.02	3.0	142.6	23.32
		5.0	7.89	26.02	6.56	37.50	NA	103.1	23.74
LW03-SD509-00-10C	9/9/2010	0.5	7.73	25.37	4.63	39.17	3.1	138.8	21.44
		2.5	7.78	25.85	4.66	35.33	2.5	137.4	22.25
		4.6	7.79	25.86	4.55	35.42	5.6	136.3	22.29



**TABLE D-5**

2010 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample ID	Date	Depth (feet)	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (ms/cm)	Turbidity (NTU)	ORP (mV)	Salinity (ppt)
LW03-SD510-00-10C	8/31/2010	1.1	7.90	26.52	6.73	38.96	2.2	66.8	24.72
		8.7	7.85	26.32	5.77	39.82	2.1	71.0	25.41
		18.1	7.74	26.06	4.19	40.42	7.5	72.7	25.80
LW03-SD511-00-10C	8/31/2010	0.7	7.89	26.51	6.67	39.40	2.2	44.6	25.00
		8.4	7.82	26.22	5.43	40.02	2.5	46.4	25.48
		19.8	7.81	26.09	5.03	40.31	4.6	47.6	25.73
LW03-SD512-00-10C	9/2/2010	1.1	7.94	26.56	7.46	37.73	2.0	61.3	24.00
		7.9	7.86	26.17	5.82	40.08	2.0	63.4	25.53
		13.3	7.82	26.11	5.25	40.18	3.0	64.1	25.63
LW03-SD513-00-10C	9/10/2010	1.1	7.85	25.26	6.34	36.24	1.8	152.9	22.84
		8.1	7.82	25.56	5.80	38.24	4.0	153.5	24.27
		13.8	7.78	25.47	4.90	38.28	15.8	151.5	24.30
LW03-SD514-00-10C	9/10/2010	0.9	7.87	25.81	7.24	34.75	2.8	124.1	22.05
		5.6	7.89	26.15	6.82	37.93	1.8	124.8	24.04
		9.7	7.75	25.54	5.02	38.24	7.9	124.4	24.28
LW03-SD515-00-10C	9/9/2010	0.8	7.88	26.24	6.15	31.52	3.6	114.8	19.87
		4.4	7.84	26.01	5.34	35.23	4.7	116.4	22.15
		8.7	7.84	25.84	5.15	35.33	6.3	116.2	22.22
LW03-SD516-00-10C	9/9/2010	0.9	7.77	23.87	5.56	31.81	2.2	146.4	19.58
		2.5	7.76	25.01	5.07	34.21	2.2	146.8	21.42
		3.3	7.76	25.53	4.51	34.67	3.0	145.9	21.89
LW03-SD517-00-10C	8/31/2010	1.2	7.87	26.54	6.53	38.33	2.4	62.8	24.34
		10.5	7.85	26.17	6.02	40.15	2.4	71.1	25.61
		18.6	7.67	26.01	3.07	40.56	11.1	51.4	25.90
LW03-SD518-00-10C	8/31/2010	0.7	7.90	26.56	6.95	38.26	2.4	53.0	24.30
		10.9	7.85	26.13	5.67	40.21	2.3	57.0	25.65
		19.2	7.76	26.07	4.41	40.36	17.7	-27.4	25.76
LW03-SD519-00-10C	9/2/2010	6.0	7.94	26.58	7.19	38.76	2.3	52.4	24.31
		9.9	7.85	26.17	5.77	40.08	2.2	55.1	25.55
		17.3	7.80	26.09	4.96	40.24	9.8	55.7	25.66

**TABLE D-5**

2010 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample ID	Date	Depth (feet)	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (ms/cm)	Turbidity (NTU)	ORP (mV)	Salinity (ppt)
LW03-SD520-00-10C	9/10/2010	0.5	7.83	25.09	4.94	34.47	2.3	180.0	21.66
		7.8	7.83	25.81	5.79	38.28	2.9	170.4	24.29
		14.7	7.75	25.43	4.86	38.31	10.0	164.8	24.32
LW03-SD521-00-10C	9/12/2010	0.9	7.71	25.14	4.63	35.89	1.6	159.6	22.59
		6.3	7.83	24.91	5.84	36.36	1.5	159.5	22.96
		14.8	7.76	25.02	5.32	36.45	3.8	156.1	23.02
LW03-SD522-00-10C	9/9/2010	0.5	7.90	26.31	6.23	34.11	3.5	117.1	21.43
		4.3	7.87	25.93	5.80	35.12	2.4	118.7	22.08
		8.8	7.84	25.80	5.13	35.33	8.7	118.9	22.22
LW03-SD523-00-10C	9/9/2010	0.9	7.82	25.83	5.09	35.22	2.4	125.6	22.11
		3.6	7.84	25.86	5.14	35.36	2.8	124.8	22.23
		6.0	7.85	25.74	5.13	35.34	4.5	124.9	22.24
LW03-SD525-00-10C	9/2/2010	1.2	7.96	26.53	7.17	38.36	2.5	42.2	24.18
		9.2	7.85	26.18	5.75	40.07	2.0	45.1	25.55
		19.0	7.78	26.07	4.72	40.31	10.3	42.5	25.72
LW03-SD526-00-10C	9/10/2010	0.7	7.90	25.24	7.18	35.48	2.3	155.4	22.50
		9.2	7.83	25.78	5.67	38.28	3.3	156.4	24.29
		16.6	7.74	27.73	4.07	38.30	11.8	69.3	24.31
LW03-SD527-00-10C	9/12/2010	0.8	7.76	25.00	5.47	36.15	1.4	177.6	22.74
		5.7	7.83	24.93	6.03	36.34	1.6	177.2	22.90
		12.9	7.79	25.01	5.62	36.43	1.9	176.9	23.01
LW03-SD528-00-10C	9/9/2010	0.6	7.89	26.31	6.37	34.10	2.3	122.7	21.48
		6.7	7.88	25.96	5.96	35.22	2.7	122.7	22.15
		12.3	7.81	25.77	4.93	35.35	11.0	120.5	22.24
LW03-SD529-00-10C	9/9/2010	0.9	7.85	25.83	5.44	35.32	2.2	125.2	22.22
		4.3	7.85	25.73	5.28	35.34	3.1	125.1	22.24
		8.5	7.84	25.68	5.14	35.35	4.7	125.0	22.24
LW03-SD530-00-10C	9/2/2010	0.7	7.89	26.56	6.77	38.83	2.1	13.3	24.36
		10.7	7.86	26.16	5.83	40.07	2.2	18.9	25.55
		20.3	7.76	26.04	3.78	40.40	5.9	20.0	25.83

**TABLE D-5**

2010 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample ID	Date	Depth (feet)	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (ms/cm)	Turbidity (NTU)	ORP (mV)	Salinity (ppt)
LW03-SD533-00-10C	9/1/2010	0.9	7.90	26.81	6.89	39.13	2.4	-40.3	24.73
		10.8	7.89	26.14	6.20	39.81	2.5	-29.5	25.36
		18.1	7.70	26.13	3.62	40.20	7.4	-29.8	25.68
LW03-SD534-00-10C	9/1/2010	1.2	7.90	26.47	6.57	39.62	2.2	94.1	25.21
		15.5	7.83	26.16	5.40	40.16	3.2	94.7	25.59
		29.7	6.83	25.62	0.54	41.32	50.0	-154.8	26.47
LW03-SD535-00-10C	9/1/2010	0.7	7.82	27.32	5.99	38.70	2.8	-19.0	39.03
		7.3	7.86	26.42	5.90	39.58	2.8	-10.0	25.18
		12.3	7.78	26.20	4.64	39.82	4.7	-7.3	25.37
LW03-SD537-00-10C	9/1/2010	1.1	7.94	26.87	7.26	38.50	2.1	-50.7	24.78
		9.5	7.87	26.19	6.14	39.89	1.9	-33.5	25.42
		17.4	7.80	26.11	4.82	40.13	7.8	-26.8	25.59
LW03-SD538-00-10C	9/1/2010	0.6	7.93	26.64	7.12	39.23	2.4	-7.3	24.96
		15.4	7.84	26.15	5.59	40.01	2.7	-1.8	25.50
		26.2	7.25	25.94	0.77	41.16	8.5	-134.0	26.32
LW03-SD539-00-10C	9/1/2010	0.5	7.93	27.05	7.15	39.08	2.0	18.5	24.84
		15.1	7.77	26.17	4.54	39.90	4.3	21.5	25.42
		29.3	7.16	25.54	0.54	41.22	28.0	-174.9	26.37
LW03-SD540-00-10C	9/1/2010	0.6	7.97	26.72	7.50	39.28	2.4	-59.8	25.03
		8.1	7.92	26.27	6.72	39.59	2.1	-48.0	25.21
		16.2	7.73	26.11	4.03	40.01	6.6	-43.1	25.49
LW03-SD541-00-10C	9/7/2010	1.1	7.96	26.79	7.55	39.24	1.8	-9.4	24.95
		6.8	7.90	26.51	6.33	39.50	1.6	-5.0	25.15
		10.7	7.85	26.29	5.80	39.66	7.0	-33.4	25.26
LW03-SD543-00-10C	9/1/2010	0.5	7.96	26.93	7.52	36.76	2.4	-4.6	23.57
		10.8	7.86	26.17	5.99	39.91	2.4	4.3	25.42
		19.1	7.68	26.05	3.40	40.45	5.2	6.1	25.72
LW03-SD544-00-10C	9/1/2010	0.8	7.95	27.07	7.39	39.03	2.5	15.6	24.58
		17.1	7.80	26.10	4.96	40.18	5.7	14.5	25.66
		31.4	6.97	25.04	0.63	41.39	14.5	-189.2	26.49

**TABLE D-5**

2010 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample ID	Date	Depth (feet)	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (ms/cm)	Turbidity (NTU)	ORP (mV)	Salinity (ppt)
LW03-SD545-00-10C	9/1/2010	1.1	7.90	27.21	7.29	39.04	1.8	11.5	24.64
		10.8	7.86	26.21	6.17	39.71	1.9	14.7	25.28
		18.9	7.63	26.03	2.90	40.26	8.3	7.3	25.66
LW03-SD546-00-10C	9/1/2010	1.6	7.97	26.46	7.48	39.39	2.0	8.9	25.05
		9.5	7.93	26.36	6.77	39.55	2.0	12.0	25.18
		18.1	7.72	26.06	3.07	40.01	8.2	-75.0	25.50
LW03-SD547-00-10C	9/7/2010	1.1	7.95	27.13	7.58	38.48	2.0	62.5	24.68
		8.9	7.88	26.34	6.34	39.54	2.0	63.1	25.16
		15.9	7.75	26.17	4.29	39.87	92.0	44.8	25.41
LW03-SD548-00-10C	9/9/2010	0.5	7.84	25.13	6.28	32.03	3.2	130.3	21.38
		12.6	7.86	25.63	5.61	35.42	5.2	126.1	22.32
		21.6	7.91	25.44	5.32	35.42	5.2	162.1	22.32
LW03-SD549-00-10C	9/9/2010	1.1	7.86	25.90	6.13	34.37	1.6	120.3	21.58
		10.3	7.86	25.70	5.62	35.30	2.0	120.4	22.21
		20.5	7.87	25.50	5.12	35.35	33.0	60.3	22.36
LW03-SD550-00-10C	9/8/2010	0.6	7.82	26.37	5.33	37.46	2.7	105.1	23.73
		10.9	7.79	26.18	4.44	37.77	2.9	105.2	23.93
		18.6	7.74	25.88	4.09	37.75	6.4	87.9	23.92
LW03-SD551-00-10C	9/8/2010	0.7	7.85	NA	5.64	36.87	2.9	112.4	23.45
		9.8	7.82	NA	4.90	37.61	2.6	112.9	23.82
		18.5	7.87	NA	5.15	37.69	10.2	112.8	23.87
LW03-SD552-00-10C	9/7/2010	0.7	8.01	27.33	8.27	37.90	2.7	98.8	23.47
		10.5	7.93	26.37	6.80	39.49	2.1	100.3	25.14
		17.5	7.81	26.20	4.79	39.74	3.1	89.9	25.33
LW03-SD553-00-10C	9/7/2010	1.0	7.94	26.84	7.54	38.62	2.7	80.4	24.33
		6.6	7.93	26.48	7.11	39.39	3.1	81.0	25.06
		13.2	7.85	26.25	5.88	39.63	2.8	81.2	25.22
LW03-SD555-00-10C	9/9/2010	0.9	7.87	25.93	5.56	33.48	2.3	111.2	21.10
		9.5	7.88	25.83	5.83	35.27	1.6	111.1	22.18
		NA	7.89	19.70	5.55	35.46	4.9	85.0	22.36

**TABLE D-5**

2010 Water Column Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample ID	Date	Depth (feet)	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (ms/cm)	Turbidity (NTU)	ORP (mV)	Salinity (ppt)
LW03-SD556-00-10C	9/8/2010	0.5	7.84	26.46	5.55	36.81	2.8	112.2	23.35
		9.7	7.88	25.95	5.45	37.59	2.0	112.2	23.76
		18.7	7.80	25.83	1.76	37.73	7.7	110.0	23.90
LW03-SD557-00-10C	9/8/2010	0.8	7.90	26.31	5.10	37.24	9.0	119.4	23.68
		11.1	7.83	26.09	5.02	37.64	2.7	118.5	23.83
		NA	7.86	20.50	4.70	37.68	10.1	102.6	23.89
LW03-SD558-00-10C	9/8/2010	0.7	7.83	25.63	5.61	36.33	1.6	135.2	22.86
		12.9	7.83	26.20	5.07	37.66	2.0	134.8	23.85
		22.4	7.72	26.07	3.56	37.86	8.6	132.4	23.99
LW03-SD559-00-10C	9/7/2010	0.8	7.94	26.84	7.02	38.53	1.9	95.1	24.23
		6.0	7.90	26.37	7.03	39.25	1.9	95.5	24.98
		11.3	7.90	26.29	6.35	39.41	1.7	95.8	25.09
LW03-SD562-00-10C	9/8/2010	0.5	7.85	26.23	5.45	37.48	3.1	111.6	23.74
		10.6	7.86	25.92	5.19	37.62	2.6	112.0	23.85
		18.7	7.79	25.81	4.07	37.71	9.7	37.4	23.88
LW03-SD563-00-10C	9/8/2010	1.3	7.84	26.13	4.99	37.37	2.3	116.6	23.67
		10.1	7.83	26.03	5.06	37.65	2.3	116.1	23.85
		20.5	7.84	25.83	2.60	37.67	9.4	45.4	23.87
LW03-SD564-00-10C	9/8/2010	0.6	7.83	26.09	5.48	36.92	2.2	119.5	23.45
		11.5	7.80	26.09	4.61	37.60	3.7	119.9	23.81
		22.5	7.78	26.03	2.20	37.82	6.6	15.0	23.95
LW03-SD567-00-10C	9/8/2010	1.1	7.88	26.35	5.60	37.31	3.3	102.6	23.66
		10.6	7.89	25.84	5.61	37.58	2.3	103.7	23.73
		18.7	7.80	25.83	4.16	37.67	5.0	83.0	23.87
LW03-SD571-00-10C	9/8/2010	1.2	7.88	26.26	5.65	37.40	2.2	110.4	23.59
		11.5	7.88	25.84	5.30	37.61	2.7	111.0	23.80
		18.5	7.79	25.72	2.31	37.70	NA	66.5	23.88
LW03-SD574-00-10C	8/31/2010	0.9	7.87	26.61	6.55	38.40	2.0	151.2	24.71
		10.5	7.84	26.14	5.45	40.15	3.0	150.6	25.61
		17.2	7.68	26.02	3.54	40.55	4.9	41.6	25.91

NA - Not Available

TABLE D-6

2002 and 2007 Sediment Parameter Measurements

*SWMU 3 Benthic Invertebrate Evaluation*

*Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample	Date	Area	Depth (in)	Maximum Depth of ABM (in)	Percent ABM	Depth of Petroleum Material or Odors (in)	Ammonia (mg/kg)	Total Organic Carbon (mg/kg)	pH	Redox	CEC (meq/100g)	SEM/AVS Ratio	Coarse gravel	Fine gravel	Coarse sand	Medium sand	Fine sand	Silt/ Clay
Surface Sediment																		
LW03-A-SD201-00-02C	10/3/2002	Near Shore	0 - 4	4	Abundant	--	2.50 U	3,015	8.13	NS	NS	NS	0.00	2.49	2.77	41.43	50.67	2.65
LW03-A-SD201P-00-02C	10/3/2002	Near Shore	0 - 4	4	Abundant	--	2.53 U	2,267	8.17	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-A-SD202-00-02C	10/4/2002	Offshore	0 - 4	4	< 5.0	--	23.1	27,980	7.75	NS	NS	NS	0.00	0.00	0.00	0.82	9.86	89.32
LW03-A-SD202P-00-02C	10/4/2002	Offshore	0 - 4	4	< 5.0	--	26.9	23,960	7.97	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-A-SD203-00-02C	10/4/2002	Marina	0 - 4	4	5.0	--	2.55 U	2,900	8.18	NS	NS	NS	0.00	0.00	0.42	34.68	60.27	4.62
LW03-B-SD201-00-02C	10/2/2002	Near Shore	0 - 4	4	Present	--	4.81	1,713	7.79	NS	NS	NS	0.00	2.03	3.55	39.13	45.19	10.09
LW03-B-SD202-00-02C	10/3/2002	Offshore	0 - 4	4	30	--	2.61 U	3,833	8.29	NS	3.40	5.83	0.00	0.75	1.03	25.25	63.78	9.18
LW03-B-SD202P-00-02C	10/3/2002	Offshore	0 - 4	4	30	--	2.54 U	3,590	8.06	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-B-SD203-00-02C	10/3/2002	Offshore	0 - 4	4	5.0	--	4.30	8,246	8.19	NS	NS	NS	0.00	0.90	1.87	23.58	46.81	26.84
LW03-C-SD201-00-02C	10/2/2002	Near Shore	0 - 4	4	90	--	2.98	2,063	7.97	NS	NS	NS	0.00	0.74	3.06	54.99	38.34	2.86
LW03-C-SD202-00-02C	10/2/2002	Offshore	0 - 4	4	10	--	9.73	22,010	8.14	NS	NS	NS	0.00	0.00	0.23	4.56	20.33	74.89
LW03-C-SD203-00-02C	10/2/2002	Marina	0 - 4	4	< 5.0	--	30.5	24,170	7.62	NS	NS	NS	0.00	0.00	0.00	1.39	6.01	92.60
LW03-D-SD201-00-02C	10/2/2002	Near Shore	0 - 4	4	Abundant	--	2.55 U	5,008	8.32	NS	3.50	9.88	0.00	1.79	2.65	39.79	52.52	3.26
LW03-D-SD202-00-02C	10/2/2002	Offshore	0 - 4	4	5.0	--	4.71	21,890	8.14	NS	NS	NS	0.00	0.00	0.15	5.08	20.83	73.94
LW03-D-SD203-00-02C	10/2/2002	Offshore	0 - 4	4	5 - 10	--	23.5	26,880	8.04	NS	NS	NS	0.00	0.00	0.10	1.19	10.31	88.40
LW03-E-SD201-00-02C	10/3/2002	Near Shore	0 - 4	4	Present	--	3.57	1,746	7.94	NS	NS	NS	0.00	7.05	6.01	53.75	30.09	3.10
LW03-E-SD202-00-02C	10/3/2002	Offshore	0 - 4	4	< 3.0	--	82.8	29,400	8.19	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-E-SD203-00-02C	10/3/2002	Offshore	0 - 4	0	0.0	--	150	38,600	8.16	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-E1-SD202-00-02C	10/3/2002	Offshore	0 - 4	4	Present	--	197	46,890	8.15	NS	NS	NS	0.00	0.22	0.51	3.02	8.18	88.08
LW03-E1-SD203-00-02C	10/3/2002	Offshore	0 - 4	0	0.0	--	255	28,560	8.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-F-SD201-00-02C	10/4/2002	Near Shore	0 - 4	4	95	--	2.50 U	6,180	7.22	NS	NS	NS	0.00	1.52	4.43	61.91	26.63	5.51
LW03-F-SD202-00-02C	10/4/2002	Offshore	0 - 4	4	< 5.0	--	55.6	31,630	7.62	NS	NS	NS	0.00	0.00	0.36	3.19	13.84	82.61
LW03-F-SD203-00-02C	10/4/2002	Offshore	0 - 4	0	0.0	--	NS	31,740	8.18	NS	NS	NS	0.00	0.00	0.12	2.49	12.37	85.03
LW03-G-SD201-00-02C	10/4/2002	Near Shore	0 - 4	4	20 - 30	--	9.42	15,260	8.00	NS	NS	NS	0.00	3.80	11.88	30.87	33.60	19.85
LW03-G-SD201P-00-02C	10/4/2002	Near Shore	0 - 4	4	20 - 30	--	8.55	5,325	8.02	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-G-SD202-00-02C	10/4/2002	Offshore	0 - 4	4	< 5.0	--	18.7	31,600	8.00	NS	NS	NS	0.00	12.34	1.46	23.69	46.40	16.10
LW03-SD101	9/19/1998	Near Shore	0 - 4	4	Present	--	NS	971	NS	NS	NS	NS	0.00	4.70	1.20	15.90	36.30	41.90
LW03-SD102	9/19/1998	Near Shore	0 - 4	4	Present	--	NS	1,850	NS	NS	NS	NS	0.00	3.30	1.50	52.30	40.60	2.30
LW03-SD103	9/19/1998	Near Shore	0 - 4	4	Present	--	NS	2,170	NS	NS	NS	NS	0.00	13.10	16.50	43.20	25.20	2.00
LW03-SD104	9/18/1998	Near Shore	0 - 4	4	Present	--	NS	3,850	NS	NS	NS	NS	0.30	6.80	8.00	46.10	34.30	4.80
LW03-SD201-00-02C	10/3/2002	Marina	0 - 4	4	Abundant	--	2.52 U	1,976	7.90	NS	0.92	3.64	4.99	7.38	2.38	41.48	41.91	1.87
LW03-SD204-00-02C	10/3/2002	Marina	0 - 4	4	< 1.0	--	7.88	27,280	8.16	NS	13.0	0.51	0.00	0.00	0.03	2.10	20.89	76.98
LW03-SD205-00-02C	10/3/2002	Marina	0 - 4	0	0.0	--	105	29,940	8.02	NS	7.90	0.15	0.00	0.00	0.00	0.48	4.72	94.80
LW03-SD206-00-02C	10/3/2002	Marina	0 - 4	0	0.0	--	83.6	33,360	7.98	NS	8.40	0.12	0.00	0.00	0.00	0.52	4.40	95.09
LW03-SD206P-00-02C	10/3/2002	Marina	0 - 4	0	0.0	--	80.1	28,560	7.89	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-C2-SD301-0001	2/20/2007	Marina	0 - 4	0	0.0	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-C2-SD302-0001	2/20/2007	Marina	0 - 4	4	0 - 1	--	NS	65,200	NS	NS	NS	2.62	0.00	0.00	0.00	0.60	2.10	97.30
LW03-D-SD329-0001	2/22/2007	Offshore	0 - 4	4	3.0	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-D-SD330-0001	2/22/2007	Offshore	0 - 4	4	0 - 1	--	NS	39,300	NS	NS	NS	0.33	0.00	0.00	0.00	1.80	5.20	93.00
LW03-F2-SD303-0001	2/21/2007	Offshore	0 - 4	4	10	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-F2-SD305-0001	2/21/2007	Offshore	0 - 4	4	1.0	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-F2-SD306-0001	2/21/2007	Offshore	0 - 4	4	0 - 1	--	NS	28,100	NS	NS	NS	0.78	0.00	0.00	0.00	0.80	5.30	93.90
LW03-G-SD331-0001	2/23/2007	Offshore	0 - 4	4	0 - 1	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE D-6  
2002 and 2007 Sediment Parameter Measurements  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Sample	Date	Area	Depth (in)	Maximum Depth of ABM (in)	Percent ABM	Depth of Petroleum Material or Odors (in)	Ammonia (mg/kg)	Total Organic Carbon (mg/kg)	pH	Redox	CEC (meq/100g)	SEM/AVS Ratio	Coarse gravel	Fine gravel	Coarse sand	Medium sand	Fine sand	Silt/ Clay
LW03-G-SD333-0001	2/23/2007	Offshore	0 - 4	4	0 - 1	--	NS	28,100	NS	NS	NS	0.39	0.00	0.00	0.00	0.30	2.20	97.50
LW03-G-SD333P-0001	2/23/2007	Offshore	0 - 4	4	0 - 1	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-H-SD307-0001	2/21/2007	Near Shore	0 - 4	4	97	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-H-SD307P-0001	2/21/2007	Near Shore	0 - 4	4	97	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-H-SD312-000.5	2/21/2007	Offshore	0 - 4	4	30	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-H-SD316-0001	2/21/2007	Offshore	0 - 4	4	0 - 1	--	NS	27,900	NS	NS	NS	0.51	0.00	0.00	0.00	1.00	6.70	92.30
LW03-I-SD317-0001	2/22/2007	Near Shore	0 - 4	4	95	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-I-SD319-0001	2/22/2007	Offshore	0 - 4	4	0 - 1	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-I-SD323-0001	2/22/2007	Offshore	0 - 4	4	3.0	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-I-SD326-0001	2/22/2007	Offshore	0 - 4	4	0 - 1	--	NS	32,800	NS	NS	NS	0.23	0.00	0.00	0.40	3.00	11.80	84.80
LW03-I-SD326P-0001	2/22/2007	Offshore	0 - 4	4	0 - 1	--	NS	25,800	NS	NS	NS	0.13	NS	NS	NS	NS	NS	NS
Subsurface Sediment																		
LW03-A-SD201-02-02C	10/3/2002	Near Shore	12 - 18	11	Present	--	2.43 U	235	8.32	NS	NS	NS	0.00	0.00	0.10	15.35	78.56	6.00
LW03-A-SD202-02-02C	10/4/2002	Offshore	20 - 26	19	Present	--	16.4	11,510	8.44	-309.2	NS	NS	0.00	0.00	0.55	4.98	28.11	66.35
LW03-B-SD201-02-02C	10/2/2002	Near Shore	16 - 22	39	15	--	2.40 U	974	8.73	-418.1	NS	NS	1.61	18.36	2.72	34.53	38.94	3.85
LW03-B-SD201P-02-02C	10/2/2002	Near Shore	16 - 22	39	15	--	2.39 U	1,457	8.64	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-B-SD202-02-02C	10/3/2002	Offshore	47 - 53	47	Present	39 - 47	6.68	2,767	8.95	-86.8	NS	NS	0.00	0.00	0.09	8.94	39.68	51.29
LW03-C-SD201-02-02C	10/2/2002	Near Shore	14 - 20	13	95	--	2.41 U	725	8.26	-355.1	NS	NS	0.00	1.14	5.55	48.64	44.45	0.23
LW03-C-SD202-02-02C	10/2/2002	Offshore	11 - 17	10	Present	--	46.7	22,240	7.55	-395.2	NS	NS	0.00	0.00	0.00	0.77	6.30	92.93
LW03-C-SD202P-02-02C	10/2/2002	Offshore	11 - 17	10	Present	--	64.7	27,270	8.53	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-C-SD202-03-02C	10/2/2002	Offshore	31 - 69	--	--	31 - 69	70.2	3,139	8.73	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-D-SD201-02-02C	10/2/2002	Near Shore	16 - 21	25	Abundant (0-15") Present (to 25")	--	2.44 U	3,538	8.75	-221.4	NS	NS	0.00	1.41	1.97	43.07	42.27	11.28
LW03-D-SD202-02-02C	10/2/2002	Offshore	9 - 15	8	10	--	64.4	20,890	8.54	-426.2	NS	NS	0.00	0.00	0.00	0.30	3.01	96.69
LW03-D-SD202-03-02C	10/2/2002	Offshore	31 - 82	--	--	30 - 82	81.6	23,940	8.24	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-E-SD201-02-02C	10/3/2002	Near Shore	15 - 21	14	100 (0-10") Present (to 14")	10 - 36	7.22	1,507	8.94	-371.5	NS	NS	0.00	0.03	0.45	18.63	51.84	29.04
LW03-E-SD202-02-02C	10/4/2002	Offshore	8 - 14	7	< 1.0	--	308	41,090	8.07	-315.2	NS	NS	0.00	0.00	0.00	0.69	6.59	92.72
LW03-E-SD202-03-02C	10/4/2002	Offshore	28 - 34	--	--	28 - 82	175	25,720	8.02	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-E1-SD202-02-02C	10/4/2002	Offshore	6 - 12	0	0.0	--	128	32,040	8.43	NS	NS	NS	0.00	4.85	0.07	2.15	8.07	84.86
LW03-E1-SD202P-02-02C	10/4/2002	Offshore	6 - 12	0	0.0	--	209	28,460	8.40	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-F-SD201-02-02C	10/4/2002	Near Shore	19 - 25	10	98	--	3.67	9,965	8.54	159.2	NS	NS	0.00	0.00	0.49	21.12	19.62	58.76
LW03-F-SD202-02-02C	10/4/2002	Offshore	8 - 14	8	Present	20 - 60	69.6	22,580	8.55	98.8	NS	NS	0.00	0.00	0.22	3.25	18.40	78.14
LW03-G-SD201-02-02C	10/4/2002	Near Shore	15 - 21	14	Present	--	185	34,020	8.38	-57.1	NS	NS	0.00	0.00	0.10	2.91	14.05	82.94
LW03-G-SD201-03-02C	10/4/2002	Near Shore	31 - 57	--	--	31 - 57	72.2	45,590	8.48	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-G-SD202-02-02C	10/4/2002	Offshore	7 - 13	6	Present	24 - 45	47.5	24,560	8.42	40.8	NS	NS	NS	NS	NS	NS	NS	NS
LW03-SD201-02-02C	10/3/2002	Marina	19 - 21	19	Abundant (0-11") Present (to 19")	--	3.25	1,073	7.80	-143.8	NS	NS	0.00	0.43	0.83	29.42	54.33	14.99
LW03-SD204-02-02C	10/3/2002	Marina	11 - 20	10	Abundant	--	59.4	27,230	8.62	-383.6	NS	NS	0.00	0.00	0.00	7.52	46.41	46.07
LW03-SD204-03-02C	10/3/2002	Marina	52 - 63	--	--	51 - 63	29.1	9,539	8.57	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-SD205-02-02C	10/3/2002	Marina	7 - 13	0	0.0	--	261	26,360	8.07	-391.1	NS	NS	0.00	0.00	0.00	0.65	3.65	95.70
LW03-SD205-03-02C	10/3/2002	Marina	53 - 63	--	--	53 - 63	158	19,070	8.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-SD206-02-02C	10/3/2002	Marina	6 - 12	0	0.0	--	147	26,570	8.07	152.3	NS	NS	0.00	0.00	0.00	0.64	3.81	95.55
LW03-SD206-03-02C	10/3/2002	Marina	39 - 69	--	--	38 - 69	219	29,980	8.26	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE D-6  
2002 and 2007 Sediment Parameter Measurements  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Sample	Date	Area	Depth (in)	Maximum Depth of ABM (in)	Percent ABM	Depth of Petroleum Material or Odors (in)	Ammonia (mg/kg)	Total Organic Carbon (mg/kg)	pH	Redox	CEC (meq/100g)	SEM/AVS Ratio	Coarse gravel	Fine gravel	Coarse sand	Medium sand	Fine sand	Silt/ Clay
LW03-D-SD329-0405	2/22/2007	Offshore	48 - 52	48	0 - 1	28 - 48	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-F2-SD303-0203	2/21/2007	Offshore	24 - 28	24	10	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-H-SD307-0607	2/21/2007	Near Shore	72 - 76	88	50 (3-12") 25 (12-36") 35 (36-45") 15 (45-72") 1 (72-88")	36 - 88	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-H-SD312-0.501	2/21/2007	Offshore	4 - 8	33	1 - 30	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-I-SD317-0203	2/22/2007	Near Shore	26 - 30	26	95 (0-18") 30 (18-26")	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-I-SD319-0203	2/22/2007	Offshore	24 - 28	24	5 (4-24") <1 (24-92)	17 - 19	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LW03-I-SD323-0102	2/22/2007	Offshore	15 - 19	85	3.0 (3-12") 1.0 (12-85")	--	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NS - Not Sampled  
-- = Data not available



TABLE D-7  
2010 Sediment Parameter Measurements  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Sample	Date	Area	Grid	Top Depth (in)	Bottom Depth (in)	Percent ABM	Average Redox Depth (mm)	Sediment pH	SEM/AVS Ratio	TOC (MG/KG)	Grain Size (percent)						
											Large Gravel	Coarse Gravel	Fine Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt/ Clay
LW03-SD501-00-10C	9/2/2010	Near Shore	501	0	4	0.1	1.0	8.16	0.009	4,010	0.0	0.0	1.0	1.0	23.0	65.0	10.0
LW03-SD502-00-10C	9/2/2010	Near Shore	502	0	4	0.2	1.0	8.31	0.679	12,200	14.0	0.0	15.0	3.0	12.0	14.0	42.0
LW03-SD503-00-10C	9/2/2010	Near Shore	503	0	4	0.1	1.2	7.90	0.167	5,060	0.0	0.0	1.0	1.0	19.0	64.0	15.0
LW03-SD504-00-10C	8/31/2010	Near Shore	504	0	4	0.25	1.1	7.87	0.051	21,500	1.0	1.0	1.0	2.0	12.0	56.0	27.0
LW03-SD504A-00-10C	8/31/2010	Near Shore	504A	0	4	0.5	NV	7.14	0.041	29,300	0.0	0.0	2.0	1.0	3.0	39.0	55.0
LW03-SD505-00-10C	8/31/2010	Near Shore	505	0	4	1.0	4.8	7.85	0.013	5,520	0.0	0.0	0.0	1.0	11.0	65.0	23.0
LW03-SD506-00-10C	9/10/2010	Near Shore	506	0	4	2.0	8.1	8.07	0.053	1,810	0.0	3.0	0.0	2.0	42.0	45.0	8.0
LW03-SD507-00-10C	9/2/2010	Near Shore	507	0	4	0.05	0.87	7.80	2.774	2,260	0.0	0.0	0.0	1.0	22.0	68.0	9.0
LW03-SD508-00-10C	9/10/2010	Near Shore	508	0	4	0.5	2.6	7.83	0.013	23,400	0.0	0.0	1.0	0.0	17.0	59.0	23.0
LW03-SD509-00-10C	9/9/2010	Near Shore	509	0	4	20	0.5	8.60	0.111	6,020	0.0	7.0	13.0	2.0	34.0	34.0	10.0
LW03-SD510-00-10C	8/31/2010	Offshore	510	0	4	0.5	7.3	7.96	0.050	19,700	0.0	0.0	0.0	0.0	4.0	32.0	64.0
LW03-SD511-00-10C	8/31/2010	Offshore	511	0	4	0.8	5.9	7.31	0.025	11,500	0.0	0.0	0.0	0.0	13.0	58.0	29.0
LW03-SD512-00-10C	9/2/2010	Offshore	512	0	4	0.3	0.8	8.24	0.895	7,220	0.0	0.0	0.0	0.0	9.0	56.0	35.0
LW03-SD513-00-10C	9/10/2010	Marina	513	0	4	1.5	0.5	7.92	0.011	6,710	0.0	0.0	4.0	6.0	8.0	48.0	34.0
LW03-SD514-00-10C	9/10/2010	Marina	514	0	4	1.2	0.5	8.03	0.007	17,500	0.0	0.0	1.0	1.0	5.0	42.0	51.0
LW03-SD515-00-10C	9/9/2010	Marina	515	0	4	5.0	7.3	7.95	0.013	23,200	0.0	0.0	0.0	4.0	16.0	61.0	19.0
LW03-SD516-00-10C	9/9/2010	Near Shore	516	0	4	50	NV	8.20	1.105	2,180	0.0	0.0	5.0	2.0	48.0	41.0	4.0
LW03-SD517-00-10C	8/31/2010	Offshore	517	0	4	0.25	2.0	7.97	0.038	36,700	0.0	0.0	0.0	0.0	1.0	11.0	88.0
LW03-SD518-00-10C	8/31/2010	Offshore	518	0	4	0.2	3.8	8.11	0.010	32,400	0.0	0.0	0.0	0.0	1.0	13.0	86.0
LW03-SD519-00-10C	9/2/2010	Marina	519	0	4	0.4	0.75	8.24	0.225	19,700	0.0	0.0	0.0	0.0	8.0	33.0	59.0
LW03-SD520-00-10C	9/10/2010	Marina	520	0	4	1.5	0.5	7.58	0.001	30,000	8.0	0.0	6.0	10.0	10.0	17.0	49.0
LW03-SD521-00-10C	9/12/2010	Marina	521	0	4	5.0	NV	8.21	0.015	26,900	0.0	0.0	0.0	5.0	7.0	28.0	60.0
LW03-SD522-00-10C	9/9/2010	Marina	522	0	4	9.0	5.3	7.78	0.029	8,130	0.0	0.0	0.0	0.0	17.0	60.0	23.0
LW03-SD523-00-10C	9/9/2010	Near Shore	523	0	4	35	0.5	8.83	0.013	5,770	12.0	0.0	13.0	3.0	36.0	29.0	7.0
LW03-SD525-00-10C	9/2/2010	Marina	525	0	4	0.6	NV	8.14	0.454	35,500	0.0	0.0	0.0	0.0	9.0	22.0	69.0
LW03-SD526-00-10C	9/10/2010	Marina	526	0	4	0.01	NV	8.01	0.002	35,300	0.0	0.0	0.0	0.0	1.0	6.0	93.0
LW03-SD527-00-10C	9/12/2010	Marina	527	0	4	2.0	1.5	8.16	0.008	28,700	0.0	0.0	1.0	8.0	3.0	9.0	79.0
LW03-SD528-00-10C	9/9/2010	Offshore	528	0	4	No data	1.5	7.72	0.004	16,500	0.0	0.0	0.0	1.0	8.0	44.0	47.0
LW03-SD529-00-10C	9/9/2010	Near Shore	529	0	4	15	1.1	8.93	0.051	4,860	0.0	0.0	3.0	5.0	31.0	52.0	9.0
LW03-SD530-00-10C	9/2/2010	Marina	530	0	4	0.6	NV	6.98	0.122	44,300	0.0	0.0	0.0	0.0	13.0	21.0	66.0
LW03-SD533-00-10C	9/1/2010	Offshore	533	0	4	5.0	2.5	8.20	0.002	23,300	0.0	0.0	0.0	1.0	14.0	36.0	49.0
LW03-SD534-00-10C	9/1/2010	Near Shore	534	0	4	4.0	NV	8.04	0.002	24,900	0.0	0.0	6.0	3.0	33.0	31.0	27.0
LW03-SD535-00-10C	9/1/2010	Near Shore	535	0	4	20	NV	8.22	0.012	39,000	0.0	1.0	4.0	2.0	25.0	22.0	46.0
LW03-SD537-00-10C	9/1/2010	Offshore	537	0	4	3.0	7.0	8.66	0.017	19,700	0.0	0.0	0.0	0.0	3.0	8.0	89.0
LW03-SD538-00-10C	9/1/2010	Dry Dock	538	0	4	1.0	NV	7.94	0.002	45,300	0.0	0.0	0.0	1.0	2.0	9.0	88.0
LW03-SD539-00-10C	9/1/2010	Dry Dock	539	0	4	0.5	1.5	7.09	0.005	34,600	0.0	0.0	0.0	0.0	7.0	20.0	73.0
LW03-SD540-00-10C	9/1/2010	Offshore	540	0	4	4.0	NV	8.13	0.010	18,800	0.0	0.0	0.0	0.0	19.0	37.0	44.0
LW03-SD541-00-10C	9/7/2010	Near Shore	541	0	4	15	NV	8.70	0.144	42,800	0.0	0.0	5.0	3.0	24.0	30.0	38.0
LW03-SD543-00-10C	9/1/2010	Offshore	543	0	4	1.5	NV	8.30	0.051	29,100	0.0	0.0	0.0	0.0	1.0	5.0	94.0
LW03-SD544-00-10C	9/1/2010	Dry Dock	544	0	4	0.5	NV	8.02	0.002	38,800	0.0	0.0	0.0	0.0	0.0	5.0	95.0
LW03-SD545-00-10C	9/1/2010	Offshore	545	0	4	2.0	NV	8.59	0.004	24,300	0.0	0.0	0.0	0.0	2.0	7.0	91.0
LW03-SD546-00-10C	9/1/2010	Offshore	546	0	4	3.0	NV	8.37	0.004	23,000	0.0	0.0	0.0	0.0	4.0	6.0	90.0
LW03-SD547-00-10C	9/7/2010	Near Shore	547	0	4	22	NV	8.78	0.100	22,100	0.0	0.0	3.0	3.0	39.0	22.0	33.0
LW03-SD548-00-10C	9/9/2010	Offshore	548	0	4	0	NV	8.89	0.002	36,000	0.0	0.0	0.0	0.0	2.0	16.0	82.0
LW03-SD549-00-10C	9/9/2010	Offshore	549	0	4	0.01	NV	7.96	0.005	22,700	0.0	0.0	0.0	0.0	4.0	20.0	76.0

**TABLE D-7**  
 2010 Sediment Parameter Measurements  
 SWMU 3 Benthic Invertebrate Evaluation  
 Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Sample	Date	Area	Grid	Top Depth (in)	Bottom Depth (in)	Percent ABM	Average Redox Depth (mm)	Sediment pH	SEM/AVS Ratio	TOC (MG/KG)	Grain Size (percent)						
											Large Gravel	Coarse Gravel	Fine Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt/ Clay
LW03-SD550-00-10C	9/8/2010	Offshore	550	0	4	No data	NV	8.60	0.011	33,200	0.0	0.0	0.0	0.0	14.0	33.0	53.0
LW03-SD551-00-10C	9/8/2010	Offshore	551	0	4	0.3	1.0	8.94	0.018	25,800	0.0	0.0	0.0	0.0	6.0	25.0	69.0
LW03-SD552-00-10C	9/7/2010	Offshore	552	0	4	0.03	NV	8.77	0.010	37,600	0.0	0.0	0.0	0.0	2.0	10.0	88.0
LW03-SD553-00-10C	9/7/2010	Near Shore	553	0	4	30	NV	8.90	0.009	43,200	15.0	3.0	5.0	4.0	32.0	24.0	17.0
LW03-SD555-00-10C	9/9/2010	Offshore	555	0	4	<0.001	NV	8.21	0.007	32,300	0.0	0.0	0.0	0.0	10.0	17.0	73.0
LW03-SD556-00-10C	9/8/2010	Offshore	556	0	4	0.02	NV	8.65	0.011	24,400	0.0	0.0	0.0	0.0	10.0	14.0	76.0
LW03-SD557-00-10C	9/8/2010	Offshore	557	0	4	0.03	NV	8.41	0.005	36,700	0.0	0.0	0.0	0.0	4.0	19.0	77.0
LW03-SD558-00-10C	9/8/2010	Offshore	558	0	4	0.4	NV	8.72	0.012	33,900	0.0	0.0	0.0	1.0	6.0	6.0	87.0
LW03-SD559-00-10C	9/7/2010	Near Shore	559	0	4	18	NV	8.86	0.004	25,900	0.0	0.0	0.0	0.0	9.0	35.0	56.0
LW03-SD562-00-10C	9/8/2010	Offshore	562	0	4	0.01	NV	8.80	0.002	38,100	0.0	0.0	0.0	0.0	1.0	4.0	95.0
LW03-SD563-00-10C	9/8/2010	Offshore	563	0	4	0.02	1.0	8.86	0.003	28,900	0.0	0.0	0.0	0.0	2.0	10.0	88.0
LW03-SD564-00-10C	9/8/2010	Offshore	564	0	4	0.05	NV	8.58	0.005	29,800	0.0	0.0	0.0	0.0	2.0	7.0	91.0
LW03-SD567-00-10C	9/8/2010	Offshore	567	0	4	0.02	0.5	8.03	0.002	27,600	0.0	0.0	0.0	0.0	2.0	8.0	90.0
LW03-SD571-00-10C	9/8/2010	Offshore	571	0	4	0.05	NV	8.61	0.003	23,600	0.0	0.0	0.0	0.0	2.0	13.0	85.0
LW03-SD574-00-10C	8/31/2010	Offshore	574	0	4	0.25	1.5	7.59	0.048	35,000	0.0	0.0	0.0	0.0	1.0	13.0	86.0

NV - Not Visible

**TABLE D-8**

2002 Benthic Invertebrate Sampling Results

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Group	Species	Pollution Sensitivity <sup>1</sup>	C-203 (Grid 527)	D-201 (Grid 529)	205 (Grid 526)	Total
Bivalvia	<i>Mercenaria mercenaria</i> (Linnaeus)	PS, EQ	0	1	0	1
Gastropoda	<i>Nassarius vibex</i> Say	--	0	3	0	3
Polychaeta	<i>Capitella capitata</i> (Fabricius)	PI, OP	1	0	0	1
	Total Organisms		1	4	0	5
	Total Density (Number per Square Meter)		19.1	76.5	0.0	--
	Number of Taxa		1	2	0	3
	Percent Dominant Taxa		100	75.0	--	--

1 - Pollution sensitivity rankings:

EQ - Equilibrium (large deep dwelling and long lived taxa that tend to dominate unstressed habitats; generally correlates to pollution-sensitive)

OP - Opportunistic (relatively stress tolerant, short lived taxa with an ability to rapidly colonize stressed habitats; generally correlates to pollution-indicative)

PI - Pollution Indicative (relatively stress tolerant, short lived taxa; based on correlations of taxa with sediment contaminants and dissolved oxygen)

PS - Pollution Sensitive (large deep dwelling and long lived taxa; based on correlations of taxa with sediment contaminants and dissolved oxygen)

Not all taxa have available ratings

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD501	LW03-SD502	LW03-SD503	LW03-SD504	LW03-SD504A	LW03-SD505	LW03-SD506	LW03-SD507
					LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504-00-10C	LW03-SD504A-00-10C	LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD507-00-10C
					Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore
					09/02/2010	09/02/2010	09/02/2010	08/30/2010	08/31/2010	08/31/2010	09/10/2010	09/02/2010
Porifera												
			Porifera (LPIL)		0	0	0	0	0	1	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	1	0	0	0	0	2	2
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		2	0	1	0	0	0	0	3
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	1	0
			Ophioglycera sp.		1	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	2	1	0	0	1	0	1	1
			Gyptis crypta		0	0	0	0	0	0	2	0
			Hesionidae (LPIL)		0	0	0	0	0	0	0	0
			Podarke obscura		1	0	0	0	1	0	1	0
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0	0	0	0
			Nereididae (LPIL)		6	1	0	0	0	0	1	1
			Platynereis dumerilii		0	0	0	0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	1
			Ampharetidae (LPIL)		1	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	2	2	0	0	2	1	4	1
			Aphelochaeta sp.		0	5	1	0	0	0	0	5
			Cirratulidae (LPIL)		1	0	0	0	0	0	7	0
			Tharyx sp.		0	0	0	0	0	0	3	0
			Pectinaria gouldii		0	0	0	0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	1	0
			Demonax microphthalmus		0	4	0	0	0	0	0	0
			Sabellidae (LPIL)		0	1	0	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	3	0
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	0	0	1	0	0	0
			Serpulidae (LPIL)		0	1	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD501	LW03-SD502	LW03-SD503	LW03-SD504	LW03-SD504A	LW03-SD505	LW03-SD506	LW03-SD507
					LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504-00-10C	LW03-SD504A-00-10C	LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD507-00-10C
					Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore
					09/02/2010	09/02/2010	09/02/2010	08/30/2010	08/31/2010	08/31/2010	09/10/2010	09/02/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	0	0	4	1	0
			Polydora cornuta	PI, OP	0	0	0	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0	0	0	0
			Scolelepis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	3	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	1	0	1	0	2	1	0	2
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	1	0	0	0	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	2	0	0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	7	0	3	0	1	1	2	0
			Capitella jonesi	PI, OP	0	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	1	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	2	0	1	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	5	0	2	0	4	1	5	3
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		1	4	1	0	1	0	6	1
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	1	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD501	LW03-SD502	LW03-SD503	LW03-SD504	LW03-SD504A	LW03-SD505	LW03-SD506	LW03-SD507
					LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504-00-10C	LW03-SD504A-00-10C	LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD507-00-10C
					Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore
					09/02/2010	09/02/2010	09/02/2010	08/30/2010	08/31/2010	08/31/2010	09/10/2010	09/02/2010
			Decapoda (LPIL)		0	0	0	0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	0	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	1
			Neomysis americana		0	0	0	0	0	0	0	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	0
			Balanomorpha (LPIL)		1	2	0	0	0	0	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	0	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	1	0	0	0	0	0	1	0
			Acteocina sp.		0	0	0	0	0	0	0	1
			Odostomia engonia		0	1	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	1	0
			Astyris lunata		0	0	1	0	0	0	0	0
			Nassarius vibex		0	0	0	0	0	0	0	1
			Pyrgocythara plicosa		0	1	0	0	0	0	4	0
			Crepidula fornicata		8	5	0	0	0	0	17	0
			Crepidula plana		2	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	1	0	0	0	0	0	0
			Epitonium rupicola		0	1	0	0	0	0	0	0
			Gastropoda (LPIL)		0	1	0	0	0	0	0	1
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	1	0
			Amygdalum papyrium		1	0	1	0	0	0	0	0
			Anomia simplex		0	0	0	0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0	0	0	0
			Mulinia lateralis	OP	1	2	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0	0	0	0
			Macoma tenta		2	0	0	0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0	0	0	0
			Gemma gemma	OP	6	5	2	0	0	1	4	2
			Mercenaria mercenaria	PS, EQ	0	0	0	2	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD501	LW03-SD502	LW03-SD503	LW03-SD504	LW03-SD504A	LW03-SD505	LW03-SD506	LW03-SD507
					LW03-SD501-00-10C	LW03-SD502-00-10C	LW03-SD503-00-10C	LW03-SD504-00-10C	LW03-SD504A-00-10C	LW03-SD505-00-10C	LW03-SD506-00-10C	LW03-SD507-00-10C
					Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore	Near Shore
					09/02/2010	09/02/2010	09/02/2010	08/30/2010	08/31/2010	08/31/2010	09/10/2010	09/02/2010
			Veneridae (LPIL)		1	3	3	0	0	1	12	0
			Bivalvia (LPIL)		0	0	0	0	0	0	0	3
Phoronida												
			Phoronida (LPIL)		7	6	3	0	0	8	26	12
Chordata												
			Branchiostoma sp.		0	0	0	0	0	0	0	2
			Total Organisms		60	53	23	3	13	19	107	43
			Taxa Richness (Number of Taxa)		22	23	13	2	8	9	24	18
			Total Density (Number per Square Meter)		862	761	330	43	187	273	1,537	618
			Percent Contribution of Dominant Taxon		13.3	11.3	13.0	66.7	30.8	42.1	24.3	27.9
			Density (No./Square Meter) Dominant Taxon		115	86	43	29	57	115	374	172
			Percent Spionid Polychaetes		1.67	0.00	17.4	0.00	15.4	26.3	0.93	4.65
			Percent Mediomastus and Capitella Polychaetes		21.7	13.2	26.1	33.3	46.2	10.5	12.1	9.30
			Density of Pollution Tolerant Organisms		187	43	86	14	101	101	115	72
			Percent Pollution Tolerant Organisms		21.7	5.66	26.1	33.3	53.8	36.8	7.48	11.6
			Density of Pollution Sensitive Organisms		72	43	0	29	43	14	101	29
			Percent Pollution Sensitive Organisms		8.33	5.66	0.00	66.7	23.1	5.26	6.54	4.65
			Ratio Pollution Sensitive/ Pollution Tolerant		0.38	1.00	0.00	2.00	0.43	0.14	0.88	0.40
			Shannon Diversity Index (Base e)		2.76	2.91	2.44	0.64	1.93	1.78	2.59	2.52
			Shannon Diversity Index (Base 2)		3.98	4.20	3.52	0.92	2.78	2.56	3.74	3.64
			Percent Amphipods		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Percent Bivalves		18.3	18.9	26.1	66.7	0.00	10.5	15.9	11.6
			Percent Deposit Feeders		32.5	17.9	30.4	33.3	61.5	26.3	25.2	14.0

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD508	LW03-SD509	LW03-SD510	LW03-SD511	LW03-SD512	LW03-SD513	LW03-SD514	LW03-SD515
					LW03-SD508-00-10C	LW03-SD509-00-10C	LW03-SD510-00-10C	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C	LW03-SD515-00-10C
					Near Shore	Near Shore	Offshore	Offshore	Offshore	Marina	Marina	Marina
					09/10/2010	09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/10/2010	09/09/2010
Porifera												
			Porifera (LPIL)		0	0	0	0	0	0	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	1	0	0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	0	1	0	0	0	2
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	1	0	0	2	1	0	0	3
			Gyptis crypta		0	0	0	0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0	0	0	0
			Podarke obscura		0	1	0	0	0	0	1	1
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	1	2	0	0	0	1	0	0
			Nereididae (LPIL)		0	0	0	0	1	0	0	0
			Platynereis dumerilii		0	1	0	0	0	0	0	1
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	1	0	1	5	0	0	2	1
			Aphelochaeta sp.		0	0	0	0	0	0	0	0
			Cirratulidae (LPIL)		0	0	1	1	0	0	0	1
			Tharyx sp.		0	0	2	0	0	0	0	0
			Pectinaria gouldii		0	0	0	1	0	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0	0	0	0
			Sabellidae (LPIL)		0	0	1	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	1	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	0	0
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	0	0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0	0	1	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0



**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD508	LW03-SD509	LW03-SD510	LW03-SD511	LW03-SD512	LW03-SD513	LW03-SD514	LW03-SD515
					LW03-SD508-00-10C	LW03-SD509-00-10C	LW03-SD510-00-10C	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C	LW03-SD515-00-10C
					Near Shore	Near Shore	Offshore	Offshore	Offshore	Marina	Marina	Marina
					09/10/2010	09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/10/2010	09/09/2010
			Marenzelleria viridis	PS	0	1	0	0	0	0	0	1
			Paraprionospio pinnata	PI, OP	0	0	8	10	4	0	0	2
			Polydora cornuta	PI, OP	2	0	0	2	0	1	0	1
			Pseudopolydora sp.		0	0	0	0	1	0	0	0
			Scolecopsis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	9	1	5	0	1	0	4	5
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	1	0	0	3	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	14	11	0	0	0	15	5	2
			Capitella jonesi	PI, OP	1	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	1	0	0	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	2	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		1	0	0	0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	1
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD508	LW03-SD509	LW03-SD510	LW03-SD511	LW03-SD512	LW03-SD513	LW03-SD514	LW03-SD515
					LW03-SD508-00-10C	LW03-SD509-00-10C	LW03-SD510-00-10C	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C	LW03-SD515-00-10C
					Near Shore	Near Shore	Offshore	Offshore	Offshore	Marina	Marina	Marina
					09/10/2010	09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/10/2010	09/09/2010
			Decapoda (LPIL)		0	0	0	0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	0	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	0
			Neomysis americana		0	0	0	0	0	0	0	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	4	0	0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0	0	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	0	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	0	0	0	7	0	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	1	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		0	1	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0	0	0	0
			Crepidula fornicata		0	3	0	0	0	0	0	0
			Crepidula plana		0	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	2	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	1	0	0	0	0	0	0
			Pododesmus rudis		0	1	0	0	0	0	0	0
			Crassostrea virginica		0	1	0	0	0	0	0	0
			Mulinia lateralis	OP	2	0	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0	0	0	0
			Macoma tenta		0	0	0	2	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0	0	0	0
			Gemma gemma	OP	1	60	0	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	2	1	0	0	0	0	0	0

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SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD508	LW03-SD509	LW03-SD510	LW03-SD511	LW03-SD512	LW03-SD513	LW03-SD514	LW03-SD515
					LW03-SD508-00-10C	LW03-SD509-00-10C	LW03-SD510-00-10C	LW03-SD511-00-10C	LW03-SD512-00-10C	LW03-SD513-00-10C	LW03-SD514-00-10C	LW03-SD515-00-10C
					Near Shore	Near Shore	Offshore	Offshore	Offshore	Marina	Marina	Marina
					09/10/2010	09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/10/2010	09/09/2010
			Veneridae (LPIL)		0	1	2	5	0	0	0	0
			Bivalvia (LPIL)		0	1	0	0	0	0	0	1
Phoronida												
			Phoronida (LPIL)		3	0	4	20	0	1	0	4
Chordata												
			Branchiostoma sp.		0	1	0	0	0	0	0	0
			Total Organisms		39	93	27	59	9	21	13	26
			Taxa Richness (Number of Taxa)		13	18	10	13	6	5	5	14
			Total Density (Number per Square Meter)		560	1,336	388	848	129	302	187	374
			Percent Contribution of Dominant Taxon		35.9	64.5	29.6	33.9	44.4	71.4	38.5	19.2
			Density (No./Square Meter) Dominant Taxon		201	862	115	287	57	216	72	72
			Percent Spionid Polychaetes		28.2	2.15	48.1	20.3	66.7	4.76	30.8	34.6
			Percent Mediomastus and Capitella Polychaetes		43.6	11.8	7.41	0.00	0.00	71.4	38.5	7.69
			Density of Pollution Tolerant Organisms		402	201	216	172	72	244	129	144
			Percent Pollution Tolerant Organisms		71.8	15.1	55.6	20.3	55.6	81.0	69.2	38.5
			Density of Pollution Sensitive Organisms		57	29	14	201	14	0	29	72
			Percent Pollution Sensitive Organisms		10.3	2.15	3.70	23.7	11.1	0.00	15.4	19.2
			Ratio Pollution Sensitive/ Pollution Tolerant		0.14	0.14	0.07	1.17	0.20	0.00	0.22	0.50
			Shannon Diversity Index (Base e)		2.02	1.50	2.02	2.07	1.58	0.95	1.41	2.45
			Shannon Diversity Index (Base 2)		2.91	2.16	2.92	2.99	2.28	1.38	2.04	3.53
			Percent Amphipods		0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
			Percent Bivalves		12.8	71.0	7.41	11.9	0.00	0.00	0.00	3.85
			Percent Deposit Feeders		60.3	15.1	46.3	17.8	38.9	83.3	61.5	34.6

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD516	LW03-SD517	LW03-SD518	LW03-SD519	LW03-SD520	LW03-SD521	LW03-SD522	LW03-SD523
					LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C	LW03-SD520-00-10C	LW03-SD521-00-10C	LW03-SD522-00-10C	LW03-SD523-00-10C
					Near Shore	Offshore	Offshore	Marina	Marina	Marina	Marina	Near Shore
					09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010
Porifera												
			Porifera (LPIL)		0	1	1	0	0	1	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	0	0	0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	0	0	0	0	0	0
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0	1	0	0
			Marphysa sanguinea		0	0	0	0	3	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	1	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	5	0	0	0	0	0	3	4
			Gyptis crypta		0	0	0	0	4	0	0	1
			Hesionidae (LPIL)		0	0	0	0	4	1	0	0
			Podarke obscura		0	0	0	0	13	0	0	2
			Laeonereis culveri		0	0	0	0	0	0	0	2
			Neanthes succinea	PI, OP	0	0	0	0	1	1	0	1
			Nereididae (LPIL)		1	0	0	0	0	0	0	7
			Platynereis dumerilii		0	0	0	0	0	0	0	1
			Diopatra cuprea	PS, EQ	0	0	0	1	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	2	3	2	1	0
			Aphelochaeta sp.		0	0	0	0	0	0	0	1
			Cirratulidae (LPIL)		0	0	0	0	0	1	1	2
			Tharyx sp.		0	0	0	0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0	0	1	2
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0	1	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	2	0	1
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	0	0	0	0	0	3
			Serpulidae (LPIL)		0	0	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	2	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
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Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD516	LW03-SD517	LW03-SD518	LW03-SD519	LW03-SD520	LW03-SD521	LW03-SD522	LW03-SD523
					LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C	LW03-SD520-00-10C	LW03-SD521-00-10C	LW03-SD522-00-10C	LW03-SD523-00-10C
					Near Shore	Offshore	Offshore	Marina	Marina	Marina	Marina	Near Shore
					09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	3	0	2	2	2
			Polydora cornuta	PI, OP	0	0	0	0	4	2	0	2
			Pseudopolydora sp.		0	0	0	2	0	0	0	0
			Scolecopsis texana		1	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	1	0	0	1
			Streblospio benedicti	PI, OP	1	0	0	0	14	4	14	0
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	0	0	0	0	0	0
			Pista cristata		0	0	0	0	5	2	0	0
			Terebellidae (LPIL)		0	0	0	0	0	0	2	0
			Capitella capitata complex Blake	PI, OP	2	0	0	0	7	15	1	47
			Capitella jonesi	PI, OP	0	0	0	0	2	1	2	3
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	1	0	0	0	0	0	0	1
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	7	0	0	0
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		1	0	0	0	3	0	1	5
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	1	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	1
	Clitellata											
			Paranais frici		0	0	1	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	25	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	1
			Monocorophium acherusicum		0	0	0	0	2	0	0	0
			Monocorophium insidiosum		0	0	0	0	1	0	0	0
			Monocorophium sp.		0	0	0	0	13	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	1	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	1
			Panopeidae (LPIL)		0	0	0	0	1	0	0	1
			Panopeus herbstii		0	0	0	0	0	0	0	1
			Rhithropanopeus harrisi		0	0	0	0	0	0	0	2
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	1
			Portunidae (LPIL)		1	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD516	LW03-SD517	LW03-SD518	LW03-SD519	LW03-SD520	LW03-SD521	LW03-SD522	LW03-SD523
					LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C	LW03-SD520-00-10C	LW03-SD521-00-10C	LW03-SD522-00-10C	LW03-SD523-00-10C
					Near Shore	Offshore	Offshore	Marina	Marina	Marina	Marina	Near Shore
					09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010
			Decapoda (LPIL)		0	0	2	0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	0	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	0
			Neomysis americana		0	0	0	0	0	0	0	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	3
			Balanomorpha (LPIL)		0	0	0	0	0	1	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	1	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	1	0	0	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		1	0	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0	0	0	4
			Crepidula plana		0	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	0	0	0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0	0	0	1
			Crassostrea virginica		0	0	0	0	0	0	0	1
			Mulinia lateralis	OP	0	0	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0	0	0	3
			Macoma tenta		0	0	0	0	0	0	0	0
			Tellinidae (LPIL)		1	0	0	0	0	0	0	0
			Gemma gemma	OP	17	1	0	0	0	0	2	15
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD516	LW03-SD517	LW03-SD518	LW03-SD519	LW03-SD520	LW03-SD521	LW03-SD522	LW03-SD523
					LW03-SD516-00-10C	LW03-SD517-00-10C	LW03-SD518-00-10C	LW03-SD519-00-10C	LW03-SD520-00-10C	LW03-SD521-00-10C	LW03-SD522-00-10C	LW03-SD523-00-10C
					Near Shore	Offshore	Offshore	Marina	Marina	Marina	Marina	Near Shore
					09/09/2010	08/31/2010	08/31/2010	09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010
			Veneridae (LPIL)		2	0	0	0	0	1	1	4
			Bivalvia (LPIL)		0	0	0	0	0	1	2	2
Phoronida												
			Phoronida (LPIL)		4	0	0	0	0	0	17	9
Chordata												
			Branchiostoma sp.		0	0	0	0	0	0	0	0
			Total Organisms		39	2	4	8	115	40	53	138
			Taxa Richness (Number of Taxa)		14	2	3	4	20	18	17	35
			Total Density (Number per Square Meter)		560	29	57	115	1,652	575	761	1,983
			Percent Contribution of Dominant Taxon		43.6	50.0	50.0	37.5	21.7	37.5	32.1	34.1
			Density (No./Square Meter) Dominant Taxon		244	14	29	43	359	216	244	675
			Percent Spionid Polychaetes		5.13	0.00	0.00	62.5	18.3	20.0	30.2	3.62
			Percent Mediomastus and Capitella Polychaetes		10.3	0.00	0.00	0.00	16.5	40.0	7.55	40.6
			Density of Pollution Tolerant Organisms		57	0	0	43	503	359	273	805
			Percent Pollution Tolerant Organisms		10.3	0.00	0.00	37.5	30.4	62.5	35.8	40.6
			Density of Pollution Sensitive Organisms		86	0	0	43	43	29	72	115
			Percent Pollution Sensitive Organisms		15.4	0.00	0.00	37.5	2.61	5.00	9.43	5.80
			Ratio Pollution Sensitive/ Pollution Tolerant		1.50	--	--	1.00	0.09	0.08	0.26	0.14
			Shannon Diversity Index (Base e)		2.01	0.69	1.04	1.32	2.57	2.36	2.17	2.73
			Shannon Diversity Index (Base 2)		2.90	1.00	1.50	1.91	3.71	3.41	3.13	3.93
			Percent Amphipods		0.00	0.00	0.00	0.00	13.9	0.00	1.89	0.72
			Percent Bivalves		51.3	50.0	0.00	0.00	0.00	5.00	9.43	18.8
			Percent Deposit Feeders		14.1	0.00	25.0	43.8	52.6	61.3	31.1	49.3

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD525	LW03-SD526	LW03-SD527	LW03-SD528	LW03-SD529	LW03-SD530	LW03-SD533	LW03-SD534-01
					LW03-SD525-00-10C	LW03-SD526-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C	LW03-SD533-00-10C	LW03-SD534-01-10C
					Marina	Marina	Marina	Offshore	Near Shore	Marina	Offshore	Near Shore
					09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010	09/01/2010	09/01/2010
Porifera												
			Porifera (LPIL)		0	1	1	0	0	0	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	1	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	0	37	0	7	0	0	0
			Actiniaria sp. A		0	0	0	0	1	0	0	0
			Anthozoa (LPIL)		0	0	1	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	0	1	0	0	0	0
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	1	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	3	0	0	0
			Gyptis crypta		0	0	0	0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0	0	0	0
			Podarke obscura		0	0	3	0	5	0	0	0
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	1	2	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	4	0	0	0
			Tharyx sp.		0	0	0	0	4	0	0	0
			Pectinaria gouldii		0	0	0	0	3	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	8	0	2	0	0	0
			Sabellidae (LPIL)		0	0	2	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	0	0
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	2	0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0



TABLE D-9  
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Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD525	LW03-SD526	LW03-SD527	LW03-SD528	LW03-SD529	LW03-SD530	LW03-SD533	LW03-SD534-01
					LW03-SD525-00-10C	LW03-SD526-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C	LW03-SD533-00-10C	LW03-SD534-01-10C
					Marina	Marina	Marina	Offshore	Near Shore	Marina	Offshore	Near Shore
					09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010	09/01/2010	09/01/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	3	0	0	3	0
			Polydora cornuta	PI, OP	0	0	4	0	9	0	0	0
			Pseudopolydora sp.		0	0	0	0	0	0	0	0
			Scolecopsis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	0	3	0	0	3	0	4	0
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	0	0	0	0	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	3	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	9	0	2	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	2	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	1	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		0	0	0	0	9	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	1	0	0	0
			Scoloplos rubra		0	0	0	0	2	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	1	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

TABLE D-9  
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Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD525	LW03-SD526	LW03-SD527	LW03-SD528	LW03-SD529	LW03-SD530	LW03-SD533	LW03-SD534-01
					LW03-SD525-00-10C	LW03-SD526-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C	LW03-SD533-00-10C	LW03-SD534-01-10C
					Marina	Marina	Marina	Offshore	Near Shore	Marina	Offshore	Near Shore
					09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010	09/01/2010	09/01/2010
			Decapoda (LPIL)		0	0	0	0	1	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	0	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	0
			Neomysis americana		0	0	0	0	0	0	0	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0	0	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	0	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	0	0	0	0	2	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		0	0	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0	0	0	0
			Crepidula fornicata		0	0	1	0	5	0	0	0
			Crepidula plana		0	0	0	0	2	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	0	0	0	1	0	0	0
			Pododesmus rudis		0	0	0	0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0	0	0	0
			Macoma tenta		0	0	0	0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	8	0	0	0
			Gemma gemma	OP	0	0	0	0	31	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	3	0	0	0

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Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD525	LW03-SD526	LW03-SD527	LW03-SD528	LW03-SD529	LW03-SD530	LW03-SD533	LW03-SD534-01
					LW03-SD525-00-10C	LW03-SD526-00-10C	LW03-SD527-00-10C	LW03-SD528-00-10C	LW03-SD529-00-10C	LW03-SD530-00-10C	LW03-SD533-00-10C	LW03-SD534-01-10C
					Marina	Marina	Marina	Offshore	Near Shore	Marina	Offshore	Near Shore
					09/02/2010	09/10/2010	09/12/2010	09/09/2010	09/09/2010	09/02/2010	09/01/2010	09/01/2010
			Veneridae (LPIL)		0	0	0	0	36	0	0	0
			Bivalvia (LPIL)		0	0	0	0	5	0	1	0
Phoronida												
			Phoronida (LPIL)		0	0	0	1	11	0	2	0
Chordata												
			Branchiostoma sp.		0	0	0	0	0	0	0	0
			Total Organisms		0	4	70	7	168	0	10	0
			Taxa Richness (Number of Taxa)		0	2	12	4	30	0	4	0
			Total Density (Number per Square Meter)		0	57	1,006	101	2,414	0	144	0
			Percent Contribution of Dominant Taxon		--	75.0	52.9	42.9	21.4	--	40.0	--
			Density (No./Square Meter) Dominant Taxon		--	43	532	43	517	--	57	--
			Percent Spionid Polychaetes		--	75.0	5.71	42.9	7.14	--	70.0	--
			Percent Mediomastus and Capitella Polychaetes		--	0.00	12.9	0.00	8.33	--	0.00	--
			Density of Pollution Tolerant Organisms		--	43	187	43	216	--	101	--
			Percent Pollution Tolerant Organisms		--	75.0	18.6	42.9	8.93	--	70.0	--
			Density of Pollution Sensitive Organisms		--	0	14	29	129	--	0	--
			Percent Pollution Sensitive Organisms		--	0.00	1.43	28.6	5.36	--	0.00	--
			Ratio Pollution Sensitive/ Pollution Tolerant		--	0.00	0.08	0.67	0.60	--	0.00	--
			Shannon Diversity Index (Base e)		--	0.56	1.65	1.28	2.79	--	1.28	--
			Shannon Diversity Index (Base 2)		--	0.81	2.39	1.84	4.03	--	1.85	--
			Percent Amphipods		--	0.00	0.00	0.00	0.00	--	0.00	--
			Percent Bivalves		--	0.00	0.00	0.00	50.0	--	10.0	--
			Percent Deposit Feeders		--	37.5	16.4	35.7	21.1	--	35.0	--

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

**TABLE D-9**  
 2010 Benthic Invertebrate Sampling Results  
 SWMU 3 Benthic Invertebrate Evaluation  
 Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD534-02	LW03-SD534-03	LW03-SD535	LW03-SD537	LW03-SD538	LW03-SD539	LW03-SD540	LW03-SD541
					LW03-SD534-02-10C	LW03-SD534-03-10C	LW03-SD535-00-10C	LW03-SD537-00-10C	LW03-SD538-00-10C	LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD541-00-10C
					Near Shore	Near Shore	Near Shore	Offshore	Dry Dock	Dry Dock	Offshore	Near Shore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010
Porifera												
			Porifera (LPIL)		0	0	1	0	0	0	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	0	0	0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	2	0	0	0	0	0
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	6	1	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	0	2	19	0	0	0	0	0
			Gyptis crypta		0	3	8	0	0	0	0	0
			Hesionidae (LPIL)		0	4	0	0	0	0	0	0
			Podarke obscura		0	5	10	0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	1	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	1	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0	0	0	0
			Cirratulidae (LPIL)		0	0	1	0	0	0	0	0
			Tharyx sp.		0	0	1	0	0	0	0	2
			Pectinaria gouldii		0	1	0	0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	5	0	0	0	0	1
			Sabellidae (LPIL)		0	0	0	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	0	0
			Hydroides diathus		0	0	5	0	0	0	0	0
			Hydroides sp.		0	2	1	0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD534-02	LW03-SD534-03	LW03-SD535	LW03-SD537	LW03-SD538	LW03-SD539	LW03-SD540	LW03-SD541
					LW03-SD534-02-10C	LW03-SD534-03-10C	LW03-SD535-00-10C	LW03-SD537-00-10C	LW03-SD538-00-10C	LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD541-00-10C
					Near Shore	Near Shore	Near Shore	Offshore	Dry Dock	Dry Dock	Offshore	Near Shore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	7	0	0	0	0	0	1
			Polydora cornuta	PI, OP	0	0	0	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0	0	0	0
			Scolecipis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	0	0	1	1	0	0	0	0
			Loimia medusa	PS	0	0	4	0	0	0	0	0
			Loimia sp.		0	0	0	0	0	0	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	3	1	0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	1	0	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	3	0	0	0	0	0
			Mediomastus californiensis		0	0	1	0	0	0	0	0
			Mediomastus sp.		0	1	4	0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	2	1	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisi		0	0	1	0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD534-02	LW03-SD534-03	LW03-SD535	LW03-SD537	LW03-SD538	LW03-SD539	LW03-SD540	LW03-SD541
					LW03-SD534-02-10C	LW03-SD534-03-10C	LW03-SD535-00-10C	LW03-SD537-00-10C	LW03-SD538-00-10C	LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD541-00-10C
					Near Shore	Near Shore	Near Shore	Offshore	Dry Dock	Dry Dock	Offshore	Near Shore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010
			Decapoda (LPIL)		0	0	0	0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	0	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	0
			Neomysis americana		0	0	0	0	0	0	0	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0	0	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	0	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	0	1	1	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		0	0	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0	0	0	0
			Crepidula fornicata		0	0	4	0	0	0	0	1
			Crepidula plana		0	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	1	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	1	0	0	0	0	0	1
			Pododesmus rudis		0	0	0	0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0	0	0	0
			Mulinia lateralis	OP	0	0	3	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	1	0	0	0	0	0
			Macoma tenta		0	0	0	0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0	0	0	0
			Gemma gemma	OP	0	0	3	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	2	0	0	0	0	1

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD534-02	LW03-SD534-03	LW03-SD535	LW03-SD537	LW03-SD538	LW03-SD539	LW03-SD540	LW03-SD541
					LW03-SD534-02-10C	LW03-SD534-03-10C	LW03-SD535-00-10C	LW03-SD537-00-10C	LW03-SD538-00-10C	LW03-SD539-00-10C	LW03-SD540-00-10C	LW03-SD541-00-10C
					Near Shore	Near Shore	Near Shore	Offshore	Dry Dock	Dry Dock	Offshore	Near Shore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010
			Veneridae (LPIL)		0	2	12	0	0	0	0	0
			Bivalvia (LPIL)		0	0	0	0	0	0	0	0
Phoronida												
			Phoronida (LPIL)		0	0	11	0	0	0	0	2
Chordata												
			Branchiostoma sp.		0	0	0	0	0	0	0	0
			Total Organisms		0	41	110	1	0	0	0	9
			Taxa Richness (Number of Taxa)		0	15	30	1	0	0	0	7
			Total Density (Number per Square Meter)		0	589	1,580	14	0	0	0	129
			Percent Contribution of Dominant Taxon		--	17.1	17.3	100	--	--	--	22.2
			Density (No./Square Meter) Dominant Taxon		--	101	273	14	--	--	--	29
			Percent Spionid Polychaetes		--	17.1	0.91	100	--	--	--	11.1
			Percent Mediomastus and Capitella Polychaetes		--	4.88	7.27	0.00	--	--	--	0.00
			Density of Pollution Tolerant Organisms		--	115	57	14	--	--	--	14
			Percent Pollution Tolerant Organisms		--	19.5	3.64	100	--	--	--	11.1
			Density of Pollution Sensitive Organisms		--	43	402	0	--	--	--	14
			Percent Pollution Sensitive Organisms		--	7.32	25.5	0.00	--	--	--	11.1
			Ratio Pollution Sensitive/ Pollution Tolerant		--	0.38	7.00	0.00	--	--	--	1.00
			Shannon Diversity Index (Base e)		--	2.49	2.91	0.00	--	--	--	1.89
			Shannon Diversity Index (Base 2)		--	3.60	4.20	0.00	--	--	--	2.73
			Percent Amphipods		--	0.00	0.00	0.00	--	--	--	0.00
			Percent Bivalves		--	7.32	20.0	0.00	--	--	--	22.2
			Percent Deposit Feeders		--	24.4	13.5	50.0	--	--	--	27.8

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD543	LW03-SD544	LW03-SD545	LW03-SD546	LW03-SD547	LW03-SD548	LW03-SD549	LW03-SD550-01
					LW03-SD543-00-10C	LW03-SD544-00-10C	LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD548-00-10C	LW03-SD549-00-10C	LW03-SD550-01-10C
					Offshore	Dry Dock	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010	09/09/2010	09/09/2010	09/08/2010
Porifera												
			Porifera (LPIL)		0	0	0	0	0	1	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	0	0	0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	0	0	0	0	0	0
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	2	0	0	0
			Gyptis crypta		0	0	0	0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0	0	0	0
			Podarke obscura		0	0	0	0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	1	0	0	0
			Tharyx sp.		0	0	0	0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	0	0
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	0	0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0



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2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD543	LW03-SD544	LW03-SD545	LW03-SD546	LW03-SD547	LW03-SD548	LW03-SD549	LW03-SD550-01
					LW03-SD543-00-10C	LW03-SD544-00-10C	LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD548-00-10C	LW03-SD549-00-10C	LW03-SD550-01-10C
					Offshore	Dry Dock	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010	09/09/2010	09/09/2010	09/08/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	0	0	0	0	0
			Polydora cornuta	PI, OP	0	0	0	0	1	0	0	0
			Pseudopolydora sp.		0	0	0	0	0	0	0	0
			Scolecopsis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	0	0	0	0	1	0	0	0
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	0	0	0	0	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD543	LW03-SD544	LW03-SD545	LW03-SD546	LW03-SD547	LW03-SD548	LW03-SD549	LW03-SD550-01
					LW03-SD543-00-10C	LW03-SD544-00-10C	LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD548-00-10C	LW03-SD549-00-10C	LW03-SD550-01-10C
					Offshore	Dry Dock	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010	09/09/2010	09/09/2010	09/08/2010
			Decapoda (LPIL)		0	0	0	0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	2	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	0
			Neomysis americana		0	0	0	0	0	0	0	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0	0	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	0	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	0	0	0	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		0	0	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0	0	0	0
			Crepidula plana		0	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	0	0	0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0	0	0	0
			Macoma tenta		0	0	0	0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	2	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD543	LW03-SD544	LW03-SD545	LW03-SD546	LW03-SD547	LW03-SD548	LW03-SD549	LW03-SD550-01
					LW03-SD543-00-10C	LW03-SD544-00-10C	LW03-SD545-00-10C	LW03-SD546-00-10C	LW03-SD547-00-10C	LW03-SD548-00-10C	LW03-SD549-00-10C	LW03-SD550-01-10C
					Offshore	Dry Dock	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/01/2010	09/01/2010	09/01/2010	09/01/2010	09/07/2010	09/09/2010	09/09/2010	09/08/2010
			Veneridae (LPIL)		0	0	0	0	13	0	0	0
			Bivalvia (LPIL)		0	0	0	0	0	0	0	0
Phoronida												
			Phoronida (LPIL)		0	0	0	0	0	0	0	0
Chordata												
			Branchiostoma sp.		0	0	0	0	0	0	0	0
			Total Organisms		0	0	0	0	20	1	2	0
			Taxa Richness (Number of Taxa)		0	0	0	0	6	1	1	0
			Total Density (Number per Square Meter)		0	0	0	0	287	14	29	0
			Percent Contribution of Dominant Taxon		--	--	--	--	65.0	100	100	--
			Density (No./Square Meter) Dominant Taxon		--	--	--	--	187	14	29	--
			Percent Spionid Polychaetes		--	--	--	--	10.0	0.00	0.00	--
			Percent Mediomastus and Capitella Polychaetes		--	--	--	--	0.00	0.00	0.00	--
			Density of Pollution Tolerant Organisms		--	--	--	--	29	0	0	--
			Percent Pollution Tolerant Organisms		--	--	--	--	10.0	0.00	0.00	--
			Density of Pollution Sensitive Organisms		--	--	--	--	29	0	0	--
			Percent Pollution Sensitive Organisms		--	--	--	--	10.0	0.00	0.00	--
			Ratio Pollution Sensitive/ Pollution Tolerant		--	--	--	--	1.00	--	--	--
			Shannon Diversity Index (Base e)		--	--	--	--	1.19	0.00	0.00	--
			Shannon Diversity Index (Base 2)		--	--	--	--	1.72	0.00	0.00	--
			Percent Amphipods		--	--	--	--	0.00	0.00	0.00	--
			Percent Bivalves		--	--	--	--	75.0	0.00	0.00	--
			Percent Deposit Feeders		--	--	--	--	10.0	0.00	0.00	--

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD550-02	LW03-SD550-03	LW03-SD551	LW03-SD552	LW03-SD553	LW03-SD555	LW03-SD556	LW03-SD557
					LW03-SD550-02-10C	LW03-SD550-03-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C	LW03-SD556-00-10C	LW03-SD557-00-10C
					Offshore	Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/07/2010	09/09/2010	09/08/2010	09/08/2010
Porifera												
			Porifera (LPIL)		0	0	0	0	0	0	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	0	0	0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	0	0	0	0	0	0
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	1	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	1	0	0	0
			Gyptis crypta		0	0	0	0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	1	0	0	0
			Podarke obscura		0	0	0	0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	0	0	0	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0	0	0	0
			Tharyx sp.		0	0	0	0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	0	0
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	0	0	1	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD550-02	LW03-SD550-03	LW03-SD551	LW03-SD552	LW03-SD553	LW03-SD555	LW03-SD556	LW03-SD557
					LW03-SD550-02-10C	LW03-SD550-03-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C	LW03-SD556-00-10C	LW03-SD557-00-10C
					Offshore	Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/07/2010	09/09/2010	09/08/2010	09/08/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	1	0	1	1	0	0
			Polydora cornuta	PI, OP	0	0	1	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0	0	0	0
			Scolelepis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	1	0	1	0	0	12	3	0
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	0	0	1	0	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	1	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	1	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	1	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisii		0	0	0	0	0	0	0	0
			Pinnixa sp.		0	0	0	0	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
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Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD550-02	LW03-SD550-03	LW03-SD551	LW03-SD552	LW03-SD553	LW03-SD555	LW03-SD556	LW03-SD557
					LW03-SD550-02-10C	LW03-SD550-03-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C	LW03-SD556-00-10C	LW03-SD557-00-10C
					Offshore	Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/07/2010	09/09/2010	09/08/2010	09/08/2010
			Decapoda (LPIL)		0	0	0	0	0	0	0	1
			Decapoda zoea (larva)		0	2	0	0	0	0	2	1
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	0	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		0	0	0	0	0	0	0	0
			Mysidae (LPIL)		0	0	0	0	0	0	1	0
			Neomysis americana		0	0	0	0	0	0	0	1
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	1	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0	0	0	0
		<b>Entognatha</b>										
			Collembola (LPIL)		0	0	0	0	0	0	0	0
		<b>Unspecified</b>										
			Crustacea (LPIL)		0	0	0	0	1	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	0	0	0	0	1	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		0	0	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	1	0	0	0
			Crepidula fornicata		0	0	0	0	0	0	0	0
			Crepidula plana		0	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	0	0	0	1	0	0	0
			Pododesmus rudis		0	0	0	0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	1	0	0	0
			Macoma tenta		0	0	0	0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	1	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
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Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD550-02	LW03-SD550-03	LW03-SD551	LW03-SD552	LW03-SD553	LW03-SD555	LW03-SD556	LW03-SD557	
					LW03-SD550-02-10C	LW03-SD550-03-10C	LW03-SD551-00-10C	LW03-SD552-00-10C	LW03-SD553-00-10C	LW03-SD555-00-10C	LW03-SD556-00-10C	LW03-SD557-00-10C	
					Offshore	Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore	
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/07/2010	09/09/2010	09/08/2010	09/08/2010	
			Veneridae (LPIL)		0	0	0	0	4	0	0	0	
			Bivalvia (LPIL)		0	0	0	0	0	0	0	0	
Phoronida													
			Phoronida (LPIL)		0	0	0	0	1	0	0	0	
Chordata													
			Branchiostoma sp.		0	0	0	0	0	0	0	0	
		Total Organisms		1	2	3	0	20	13	7	3		
		Taxa Richness (Number of Taxa)		1	1	3	0	17	2	4	3		
		Total Density (Number per Square Meter)		14	29	43	0	287	187	101	43		
		Percent Contribution of Dominant Taxon		100	100	33.3	--	20.0	92.3	42.9	33.3		
		Density (No./Square Meter) Dominant Taxon		14	29	14	--	57	172	43	14		
		Percent Spionid Polychaetes		100	0.00	100	--	5.00	100	42.9	0.00		
		Percent Mediomastus and Capitella Polychaetes		0.00	0.00	0.00	--	10.0	0.00	0.00	0.00		
		Density of Pollution Tolerant Organisms		14	0	43	--	43	187	43	0		
		Percent Pollution Tolerant Organisms		100	0.00	100	--	15.0	100	42.9	0.00		
		Density of Pollution Sensitive Organisms		0	0	0	--	43	0	14	0		
		Percent Pollution Sensitive Organisms		0.00	0.00	0.00	--	15.0	0.00	14.3	0.00		
		Ratio Pollution Sensitive/ Pollution Tolerant		0.00	--	0.00	--	1.00	0.00	0.33	--		
		Shannon Diversity Index (Base e)		0.00	0.00	1.10	--	2.78	0.27	1.28	1.10		
		Shannon Diversity Index (Base 2)		0.00	0.00	1.59	--	4.01	0.39	1.84	1.59		
		Percent Amphipods		0.00	0.00	0.00	--	0.00	0.00	0.00	0.00		
Percent Bivalves		0.00	0.00	0.00	--	35.0	0.00	0.00	0.00				
Percent Deposit Feeders		50.0	0.00	50.0	--	18.2	50.0	21.4	0.00				

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD558-01	LW03-SD558-02	LW03-SD558-03	LW03-SD559	LW03-SD562	LW03-SD563	LW03-SD564	LW03-SD567
					LW03-SD558-01-10C	LW03-SD558-02-10C	LW03-SD558-03-10C	LW03-SD559-00-10C	LW03-SD562-00-10C	LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C
					Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/08/2010	09/08/2010	09/08/2010	09/08/2010
Porifera												
			Porifera (LPIL)		0	0	0	1	0	0	0	0
Cnidaria												
	Hydrozoa											
			Hydrozoa (LPIL)		0	0	0	0	0	0	0	0
	Anthozoa											
			Actiniaria (LPIL)		0	0	0	0	0	0	0	0
			Actiniaria sp. A		0	0	0	0	0	0	0	0
			Anthozoa (LPIL)		0	0	0	0	0	0	0	0
Nemertea												
			Nemertea (LPIL)		0	0	0	0	0	0	0	0
Annelida												
	Polychaeta											
			Dorvillea (Schistomeringos) rudolphi		0	0	0	0	0	0	0	0
			Marphysa sanguinea		0	0	0	0	0	0	0	0
			Glycera dibranchiata		0	0	0	0	0	0	0	0
			Ophioglycera sp.		0	0	0	0	0	0	0	0
			Glycinde solitaria	PS, OP	0	0	0	0	0	0	0	0
			Gyptis crypta		0	0	0	0	0	0	0	0
			Hesionidae (LPIL)		0	0	0	0	0	0	0	0
			Podarke obscura		0	0	0	0	0	0	0	0
			Laeonereis culveri		0	0	0	0	0	0	0	0
			Neanthes succinea	PI, OP	1	0	0	0	0	0	0	0
			Nereididae (LPIL)		0	0	0	0	0	0	0	0
			Platynereis dumerilii		0	0	0	0	0	0	0	0
			Diopatra cuprea	PS, EQ	0	0	0	0	0	0	0	0
			Phyllodoce mucosa		0	0	0	0	0	0	0	0
			Phyllodocidae (LPIL)		0	0	0	0	0	0	0	0
			Syllidae (LPIL)		0	0	0	0	0	0	0	0
			Ampharetidae (LPIL)		0	0	0	0	0	0	0	0
			Spiochaetopterus costarum	PS	0	0	0	0	0	0	0	0
			Aphelochaeta sp.		0	0	0	0	0	0	0	0
			Cirratulidae (LPIL)		0	0	0	0	0	0	0	0
			Tharyx sp.		0	0	0	0	0	0	0	0
			Pectinaria gouldii		0	0	0	0	0	0	0	0
			Pectinaria sp.		0	0	0	0	0	0	0	0
			Demonax microphthalmus		0	0	0	0	0	0	0	0
			Sabellidae (LPIL)		0	0	0	0	0	0	0	0
			Sabellinae (LPIL)		0	0	0	0	0	0	0	0
			Hydroides dianthus		0	0	0	0	0	0	0	0
			Hydroides diathus		0	0	0	0	0	0	0	0
			Hydroides sp.		0	0	0	0	0	0	0	0
			Serpulidae (LPIL)		0	0	0	0	0	0	0	0
			Dipolydora cauleri		0	0	0	0	0	0	0	0



TABLE D-9  
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Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD558-01	LW03-SD558-02	LW03-SD558-03	LW03-SD559	LW03-SD562	LW03-SD563	LW03-SD564	LW03-SD567
					LW03-SD558-01-10C	LW03-SD558-02-10C	LW03-SD558-03-10C	LW03-SD559-00-10C	LW03-SD562-00-10C	LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C
					Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/08/2010	09/08/2010	09/08/2010	09/08/2010
			Marenzelleria viridis	PS	0	0	0	0	0	0	0	0
			Paraprionospio pinnata	PI, OP	0	0	0	1	0	0	0	0
			Polydora cornuta	PI, OP	0	0	0	0	0	0	0	0
			Pseudopolydora sp.		0	0	0	0	0	0	0	0
			Scolelepis texana		0	0	0	0	0	0	0	0
			Spio sp.		0	0	0	0	0	0	0	0
			Spionidae (LPIL)		0	0	0	0	0	0	0	0
			Streblospio benedicti	PI, OP	1	0	0	1	0	0	0	0
			Loimia medusa	PS	0	0	0	0	0	0	0	0
			Loimia sp.		0	0	0	0	0	0	0	0
			Pista cristata		0	0	0	0	0	0	0	0
			Terebellidae (LPIL)		0	0	0	0	0	0	0	0
			Capitella capitata complex Blake	PI, OP	0	0	0	0	0	0	0	0
			Capitella jonesi	PI, OP	0	0	0	0	0	0	0	0
			Capitella sp.	PI, OP	0	0	0	0	0	0	0	0
			Capitellidae (LPIL)		0	0	0	0	0	0	0	0
			Heteromastus filiformis	PI, OP	0	0	0	0	0	0	0	0
			Mediomastus ambiseta	PS, PI, OP	0	0	0	0	0	0	0	0
			Mediomastus californiensis		0	0	0	0	0	0	0	0
			Mediomastus sp.		0	0	0	0	0	0	0	0
			Orbiniidae (LPIL)		0	0	0	0	0	0	0	0
			Scoloplos rubra		0	0	0	0	0	0	0	0
			Clymenella torquata	PS, EQ	0	0	0	0	0	0	0	0
	Clitellata											
			Paranais frici		0	0	0	0	0	0	0	0
			Tubificoides sp.		0	0	0	0	0	0	0	0
Arthropoda												
	Malacostraca											
		Amphipoda										
			Aoridae (LPIL)		0	0	0	0	0	0	0	0
			Monocorophium acherusicum		0	0	0	0	0	0	0	0
			Monocorophium insidiosum		0	0	0	0	0	0	0	0
			Monocorophium sp.		0	0	0	0	0	0	0	0
			Listriella clymenellae	PS	0	0	0	0	0	0	0	0
		Cumacea										
			Cumacea (LPIL)		0	0	0	0	0	0	0	0
		Decapoda										
			Palaemonetes sp.		0	0	0	0	0	0	0	0
			Panopeidae (LPIL)		0	0	0	0	0	0	0	0
			Panopeus herbstii		0	0	0	0	0	0	0	0
			Rhithropanopeus harrisi		0	0	0	0	0	0	0	0
			Pinnixa sp.		0	0	0	1	0	0	0	0
			Callinectes sp.		0	0	0	0	0	0	0	0
			Portunidae (LPIL)		0	0	0	0	0	0	0	0

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD558-01	LW03-SD558-02	LW03-SD558-03	LW03-SD559	LW03-SD562	LW03-SD563	LW03-SD564	LW03-SD567
					LW03-SD558-01-10C	LW03-SD558-02-10C	LW03-SD558-03-10C	LW03-SD559-00-10C	LW03-SD562-00-10C	LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C
					Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/08/2010	09/08/2010	09/08/2010	09/08/2010
			Decapoda (LPIL)		0	0	0	0	0	0	0	0
			Decapoda zoea (larva)		0	0	0	0	0	0	0	0
		<b>Leptostraca</b>										
			Leptostraca (LPIL)		0	0	0	0	1	0	0	0
		<b>Mysida</b>										
			Americamysis sp.		1	0	0	0	0	0	1	0
			Mysidae (LPIL)		0	0	0	0	0	0	0	0
			Neomysis americana		0	0	0	0	0	0	1	0
		<b>Stomatopoda</b>										
			Squilla empusa	PS, EQ	0	0	0	0	0	0	0	0
	<b>Maxillopoda</b>											
		<b>Sessilia</b>										
			Balanus improvisus		0	0	0	0	0	0	0	0
			Balanomorpha (LPIL)		0	0	0	0	0	0	0	0
	<b>Entognatha</b>											
			Collembola (LPIL)		0	0	0	0	0	0	0	0
	<b>Unspecified</b>											
			Crustacea (LPIL)		0	0	0	0	0	0	0	0
<b>Mollusca</b>												
	<b>Gastropoda</b>											
			Acteocina canaliculata	PS	0	0	0	0	0	0	0	0
			Acteocina sp.		0	0	0	0	0	0	0	0
			Odostomia engonia		0	0	0	0	0	0	0	0
			Turbonilla interrupta		0	0	0	0	0	0	0	0
			Astyris lunata		0	0	0	0	0	0	0	0
			Nassarius vibex		0	0	0	0	0	0	0	0
			Pyrgocythara plicosa		0	0	0	0	0	0	0	0
			Crepidula fornicata		0	0	0	0	0	0	0	0
			Crepidula plana		0	0	0	0	0	0	0	0
			Cerithiopsis greenii		0	0	0	0	0	0	0	0
			Epitonium rupicola		0	0	0	0	0	0	0	0
			Gastropoda (LPIL)		0	0	0	0	0	0	0	0
	<b>Bivalvia</b>											
			Anadara transversa	PS, EQ	0	0	0	0	0	0	0	0
			Amygdalum papyrium		0	0	0	0	0	0	0	0
			Anomia simplex		0	0	0	0	0	0	0	0
			Pododesmus rudis		0	0	0	0	0	0	0	0
			Crassostrea virginica		0	0	0	0	0	0	0	0
			Mulinia lateralis	OP	0	0	0	0	0	0	0	0
			Tagelus sp.	PS, EQ?	0	0	0	0	0	0	0	0
			Macoma tenta		0	0	0	0	0	0	0	0
			Tellinidae (LPIL)		0	0	0	0	0	0	0	0
			Gemma gemma	OP	0	0	0	0	0	0	0	0
			Mercenaria mercenaria	PS, EQ	0	0	0	0	0	0	0	0

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Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD558-01	LW03-SD558-02	LW03-SD558-03	LW03-SD559	LW03-SD562	LW03-SD563	LW03-SD564	LW03-SD567
					LW03-SD558-01-10C	LW03-SD558-02-10C	LW03-SD558-03-10C	LW03-SD559-00-10C	LW03-SD562-00-10C	LW03-SD563-00-10C	LW03-SD564-00-10C	LW03-SD567-00-10C
					Offshore	Offshore	Offshore	Near Shore	Offshore	Offshore	Offshore	Offshore
					09/08/2010	09/08/2010	09/08/2010	09/07/2010	09/08/2010	09/08/2010	09/08/2010	09/08/2010
			Veneridae (LPIL)		0	0	0	0	0	0	0	0
			Bivalvia (LPIL)		0	0	0	0	0	0	0	0
Phoronida												
			Phoronida (LPIL)		0	0	0	0	0	0	0	0
Chordata												
			Branchiostoma sp.		0	0	0	0	0	0	0	0
		Total Organisms		3	0	0	4	1	0	2	0	
		Taxa Richness (Number of Taxa)		3	0	0	4	1	0	2	0	
		Total Density (Number per Square Meter)		43	0	0	57	14	0	29	0	
		Percent Contribution of Dominant Taxon		33.3	--	--	25.0	100	--	50.0	--	
		Density (No./Square Meter) Dominant Taxon		14	--	--	14	14	--	14	--	
		Percent Spionid Polychaetes		33.3	--	--	50.0	0.00	--	0.00	--	
		Percent Mediomastus and Capitella Polychaetes		0.00	--	--	0.00	0.00	--	0.00	--	
		Density of Pollution Tolerant Organisms		29	--	--	29	0	--	0	--	
		Percent Pollution Tolerant Organisms		66.7	--	--	50.0	0.00	--	0.00	--	
		Density of Pollution Sensitive Organisms		0	--	--	0	0	--	0	--	
		Percent Pollution Sensitive Organisms		0.00	--	--	0.00	0.00	--	0.00	--	
		Ratio Pollution Sensitive/ Pollution Tolerant		0.00	--	--	0.00	--	--	--	--	
		Shannon Diversity Index (Base e)		1.10	--	--	1.39	0.00	--	0.69	--	
		Shannon Diversity Index (Base 2)		1.59	--	--	2.00	0.00	--	1.00	--	
		Percent Amphipods		0.00	--	--	0.00	0.00	--	0.00	--	
Percent Bivalves		0.00	--	--	0.00	0.00	--	0.00	--			
Percent Deposit Feeders		33.3	--	--	37.5	0.00	--	0.00	--			

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD571	LW03-SD574	Total
					LW03-SD571-00-10C	LW03-SD574-00-10C	
					Offshore	Offshore	
					09/08/2010	08/31/2010	
Porifera							
			Porifera (LPIL)		0	0	9
Cnidaria							
	Hydrozoa						
			Hydrozoa (LPIL)		0	0	1
	Anthozoa						
			Actiniaria (LPIL)		0	0	50
			Actiniaria sp. A		0	0	1
			Anthozoa (LPIL)		0	0	1
Nemertea							
			Nemertea (LPIL)		0	0	12
Annelida							
	Polychaeta						
			Dorvillea (Schistomeringos) rudolphi		0	0	9
			Marphysa sanguinea		0	0	4
			Glycera dibranchiata		0	0	2
			Ophioglycera sp.		0	0	1
			Glycinde solitaria	PS, OP	0	0	52
			Gyptis crypta		0	0	18
			Hesionidae (LPIL)		0	0	10
			Podarke obscura		0	0	44
			Laeonereis culveri		0	0	2
			Neanthes succinea	PI, OP	0	0	8
			Nereididae (LPIL)		0	0	18
			Platynereis dumerilii		0	0	3
			Diopatra cuprea	PS, EQ	0	0	1
			Phyllodoce mucosa		0	0	1
			Phyllodocidae (LPIL)		0	0	1
			Syllidae (LPIL)		0	0	1
			Ampharetidae (LPIL)		0	0	1
			Spiochaetopterus costarum	PS	0	0	33
			Aphelochaeta sp.		0	0	12
			Cirratulidae (LPIL)		0	0	21
			Tharyx sp.		0	0	12
			Pectinaria gouldii		0	0	8
			Pectinaria sp.		0	0	1
			Demonax microphthalmus		0	0	20
			Sabellidae (LPIL)		0	0	5
			Sabellinae (LPIL)		0	0	1
			Hydroides dianthus		0	0	6
			Hydroides diathus		0	0	5
			Hydroides sp.		0	0	10
			Serpulidae (LPIL)		0	0	2
			Dipolydora cauleri		0	0	2

**TABLE D-9**  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD571	LW03-SD574	Total
					LW03-SD571-00-10C	LW03-SD574-00-10C	
					Offshore	Offshore	
					09/08/2010	08/31/2010	
			Marenzelleria viridis	PS	0	0	2
			Paraprionospio pinnata	PI, OP	0	0	56
			Polydora cornuta	PI, OP	0	0	29
			Pseudopolydora sp.		0	0	3
			Scoleclepis texana		0	0	1
			Spio sp.		0	0	3
			Spionidae (LPIL)		0	0	2
			Streblospio benedicti	PI, OP	0	0	97
			Loimia medusa	PS	0	0	4
			Loimia sp.		0	0	6
			Pista cristata		0	0	7
			Terebellidae (LPIL)		0	0	12
			Capitella capitata complex Blake	PI, OP	0	0	145
			Capitella jonesi	PI, OP	0	0	9
			Capitella sp.	PI, OP	0	0	1
			Capitellidae (LPIL)		0	0	2
			Heteromastus filiformis	PI, OP	0	0	9
			Mediomastus ambiseta	PS, PI, OP	0	0	32
			Mediomastus californiensis		0	0	1
			Mediomastus sp.		0	0	39
			Orbiniidae (LPIL)		0	0	1
			Scoloplos rubra		0	0	3
			Clymenella torquata	PS, EQ	0	0	2
	<b>Clitellata</b>						
			Paranais frici		0	0	1
			Tubificoides sp.		0	0	28
<b>Arthropoda</b>							
	<b>Malacostraca</b>						
		<b>Amphipoda</b>					
			Aoridae (LPIL)		0	0	2
			Monocorophium acherusicum		0	0	2
			Monocorophium insidiosum		0	0	1
			Monocorophium sp.		0	0	13
			Listriella clymenellae	PS	0	0	1
		<b>Cumacea</b>					
			Cumacea (LPIL)		0	0	1
		<b>Decapoda</b>					
			Palaemonetes sp.		0	0	1
			Panopeidae (LPIL)		0	0	2
			Panopeus herbstii		0	0	1
			Rhithropanopeus harrisii		0	0	3
			Pinnixa sp.		0	0	1
			Callinectes sp.		0	0	1
			Portunidae (LPIL)		0	0	1

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD571	LW03-SD574	Total
					LW03-SD571-00-10C	LW03-SD574-00-10C	
					Offshore	Offshore	
					09/08/2010	08/31/2010	
			Decapoda (LPIL)		0	0	4
			Decapoda zoea (larva)		0	0	7
		<b>Leptostraca</b>					
			Leptostraca (LPIL)		0	0	1
		<b>Mysida</b>					
			Americamysis sp.		0	0	2
			Mysidae (LPIL)		0	0	2
			Neomysis americana		0	0	2
		<b>Stomatopoda</b>					
			Squilla empusa	PS, EQ	0	0	1
		<b>Maxillopoda</b>					
		<b>Sessilia</b>					
			Balanus improvisus		0	0	7
			Balanomorpha (LPIL)		0	0	4
		<b>Entognatha</b>					
			Collembola (LPIL)		0	0	1
		<b>Unspecified</b>					
			Crustacea (LPIL)		0	0	1
<b>Mollusca</b>							
		<b>Gastropoda</b>					
			Acteocina canaliculata	PS	0	0	15
			Acteocina sp.		0	0	1
			Odostomia engonia		0	0	2
			Turbonilla interrupta		0	0	1
			Astiris lunata		0	0	1
			Nassarius vibex		0	0	3
			Pyrgocythara plicosa		0	0	6
			Crepidula fornicata		0	0	48
			Crepidula plana		0	0	4
			Cerithiopsis greenii		0	0	1
			Epitonium rupicola		0	0	1
			Gastropoda (LPIL)		0	0	4
		<b>Bivalvia</b>					
			Anadara transversa	PS, EQ	0	0	2
			Amygdalum papyrium		0	0	2
			Anomia simplex		0	0	5
			Pododesmus rudis		0	0	2
			Crassostrea virginica		0	0	2
			Mulinia lateralis	OP	0	0	8
			Tagelus sp.	PS, EQ?	0	0	5
			Macoma tenta		0	0	4
			Tellinidae (LPIL)		0	0	9
			Gemma gemma	OP	0	0	153
			Mercenaria mercenaria	PS, EQ	0	0	11

TABLE D-9  
2010 Benthic Invertebrate Sampling Results  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Phylum	Class	Order	Taxon	Pollution Classification <sup>1</sup>	LW03-SD571	LW03-SD574	Total
					LW03-SD571-00-10C	LW03-SD574-00-10C	
					Offshore	Offshore	
					09/08/2010	08/31/2010	
			Veneridae (LPIL)		0	0	103
			Bivalvia (LPIL)		0	0	16
Phoronida							
			Phoronida (LPIL)		0	0	152
Chordata							
			Branchiostoma sp.		0	0	3
				Total Organisms	0	0	1,509
				Taxa Richness (Number of Taxa)	0	0	
				Total Density (Number per Square Meter)	0	0	
				Percent Contribution of Dominant Taxon	--	--	
				Density (No./Square Meter) Dominant Taxon	--	--	
				Percent Spionid Polychaetes	--	--	
				Percent Mediomastus and Capitella Polychaetes	--	--	
				Density of Pollution Tolerant Organisms	--	--	
				Percent Pollution Tolerant Organisms	--	--	
				Density of Pollution Sensitive Organisms	--	--	
				Percent Pollution Sensitive Organisms	--	--	
				Ratio Pollution Sensitive/ Pollution Tolerant	--	--	
				Shannon Diversity Index (Base e)	--	--	
				Shannon Diversity Index (Base 2)	--	--	
				Percent Amphipods	--	--	
				Percent Bivalves	--	--	
				Percent Deposit Feeders	--	--	

1 - Pollution classifications:  
PS = Pollution Sensitive (Weisberg et al, 1997)  
PI = Polution Indicator (Weisberg et al. 1997)  
OP = Opportunistic (Ranasinghe et al. 1994)  
EQ = Equilibrium (Ranasinghe et al. 1994)  
? = Uncertanty due to taxonomic identification level

**TABLE D-10**

Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Relative health of benthic invertebrate communities	Are site-related chemical concentrations in sediment sufficient to adversely effect benthic invertebrate communities?	Comparison of chemical concentrations in sediment with site-specific PRGs	Benthic invertebrates
		Intra-site comparison of benthic invertebrate metric values calculated using site-specific 2010 benthic invertebrate sampling data	



TABLE D-11  
Surface Sediment Screening for SWMU 3 COCs - 2010 Samples  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Sample	Date	Grid	Area	Percent ABM	Copper (MG/KG)	RQ	Lead (MG/KG)	RQ	Nickel (MG/KG)	RQ	Tin (MG/KG)	RQ	Zinc (MG/KG)	RQ	Average RQ	Fails RQ?	Reason for Failure	ABM > 1%?	Percent ABM	Classification
LW03-SD538-00-10C	9/1/2010	538	Dry Dock	1.0	165	0.71	50.1	0.47	25.4	0.96	9.48	0.85	313	0.76	0.75	NO	--	NO	--	Unimpacted
LW03-SD539-00-10C	9/1/2010	539	Dry Dock	0.5	206	0.89	40.4	0.38	28.8	1.09	10.7	0.96	349	0.85	0.83	NO	--	NO	--	Unimpacted
LW03-SD544-00-10C	9/1/2010	544	Dry Dock	0.5	156	0.67	45.5	0.43	27.2	1.03	8.46	0.76	267	0.65	0.71	NO	--	NO	--	Unimpacted
LW03-SD513-00-10C	9/10/2010	513	Marina	1.5	71.7	0.31	64.6	0.60	11.5	0.43	9.33	0.83	232	0.57	0.55	NO	--	YES	1.50	Possibly impacted
LW03-SD514-00-10C	9/10/2010	514	Marina	1.2	241	1.04	243	2.27	22.0	0.83	18.5	1.65	473	1.15	1.39	YES	Pb, Sn, Avg	YES	1.20	Impacted
LW03-SD515-00-10C	9/9/2010	515	Marina	5.0	221	0.95	123	1.15	18.1	0.68	12.8	1.14	395	0.96	0.98	NO	--	YES	5.00	Possibly impacted
LW03-SD519-00-10C	9/2/2010	519	Marina	0.4	112	0.48	52.4	0.49	17.3	0.65	9.78	0.87	240	0.59	0.62	NO	--	NO	--	Unimpacted
LW03-SD520-00-10C	9/10/2010	520	Marina	1.5	385	1.66	177	1.65	29.2	1.10	19.7	1.76	602	1.47	1.53	YES	Cu, Pb, Sn, Avg	YES	1.50	Impacted
LW03-SD521-00-10C	9/12/2010	521	Marina	5.0	367	1.58	209	1.95	30.6	1.15	16.7	1.49	711	1.73	1.58	YES	Cu, Pb, Zn, Avg	YES	5.00	Impacted
LW03-SD522-00-10C	9/9/2010	522	Marina	9.0	300	1.29	317	2.96	22.6	0.85	25.8	2.30	699	1.70	1.82	YES	Pb, Sn, Zn, Avg	YES	9.00	Impacted
LW03-SD525-00-10C	9/2/2010	525	Marina	0.6	179	0.77	54.5	0.51	22.7	0.86	7.86	0.70	281	0.69	0.70	NO	--	NO	--	Unimpacted
LW03-SD526-00-10C	9/10/2010	526	Marina	0.01	214	0.92	68.2	0.64	25.8	0.97	10.1	0.90	374	0.91	0.87	NO	--	NO	--	Unimpacted
LW03-SD527-00-10C	9/12/2010	527	Marina	2.0	271	1.17	201	1.88	24.4	0.92	14.4	1.29	500	1.22	1.29	YES	Pb, Avg	YES	2.00	Impacted
LW03-SD530-00-10C	9/2/2010	530	Marina	0.6	169	0.73	53.3	0.50	33.0	1.25	9.49	0.85	291	0.71	0.81	NO	--	NO	--	Unimpacted
LW03-SD501-00-10C	9/2/2010	501	Near Shore	0.1	38.7	0.17	45.0	0.42	3.44	0.13	3.79	0.34	62.3	0.15	0.24	NO	--	NO	--	Unimpacted
LW03-SD502-00-10C	9/2/2010	502	Near Shore	0.2	30.2	0.13	16.5	0.15	16.6	0.63	5.52	0.49	100	0.24	0.33	NO	--	NO	--	Unimpacted
LW03-SD503-00-10C	9/2/2010	503	Near Shore	0.1	40.4	0.17	52.6	0.49	5.01	0.19	4.44	0.40	86.3	0.21	0.29	NO	--	NO	--	Unimpacted
LW03-SD504-00-10C	8/31/2010	504	Near Shore	0.25	107	0.46	44.5	0.42	10.8	0.41	5.50	0.49	172	0.42	0.44	NO	--	NO	--	Unimpacted
LW03-SD504A-00-10C	8/31/2010	504A	Near Shore	0.5	142	0.61	47.1	0.44	17.5	0.66	6.18	0.55	226	0.55	0.56	NO	--	NO	--	Unimpacted
LW03-SD505-00-10C	8/31/2010	505	Near Shore	1.0	74.3	0.32	46.4	0.43	12.4	0.47	13.6	1.21	160	0.39	0.57	NO	--	NO	--	Unimpacted
LW03-SD506-00-10C	9/10/2010	506	Near Shore	2.0	18.6	0.08	21.2	0.20	3.63	0.14	4.25	0.38	87.4	0.21	0.20	NO	--	YES	2.00	Possibly impacted
LW03-SD507-00-10C	9/2/2010	507	Near Shore	0.05	27.0	0.12	21.5	0.20	5.10	0.19	6.01	0.54	68.0	0.17	0.24	NO	--	NO	--	Unimpacted
LW03-SD508-00-10C	9/10/2010	508	Near Shore	0.5	239	1.03	180	1.68	17.1	0.65	12.3	1.10	373	0.91	1.07	YES	Pb, Avg	NO	--	Possibly impacted
LW03-SD509-00-10C	9/9/2010	509	Near Shore	20	168	0.72	202	1.89	13.6	0.51	12.4	1.11	239	0.58	0.96	YES	Pb	YES	20.0	Impacted
LW03-SD516-00-10C	9/9/2010	516	Near Shore	50	1,400	6.03	1,050	9.81	298	11.2	300	26.8	4,850	11.8	13.1	YES	All	YES	50.0	Impacted
LW03-SD523-00-10C	9/9/2010	523	Near Shore	35	2,450	10.6	2,020	18.9	661	24.9	561	50.1	8,990	21.9	25.3	YES	All	YES	35.0	Impacted
LW03-SD529-00-10C	9/9/2010	529	Near Shore	15	935	4.03	399	3.73	169	6.38	151	13.5	1,600	3.90	6.30	YES	All	YES	15.0	Impacted
LW03-SD534-00-10C	9/1/2010	534	Near Shore	4.0	615	2.65	538	5.03	46.3	1.75	45.4	4.05	711	1.73	3.04	YES	All	YES	4.00	Impacted
LW03-SD535-00-10C	9/1/2010	535	Near Shore	20	431	1.86	253	2.36	55.5	2.09	31.3	2.79	886	2.16	2.25	YES	All	YES	20.0	Impacted
LW03-SD541-00-10C	9/7/2010	541	Near Shore	15	460	1.98	205	1.92	56.1	2.12	38.4	3.43	1,700	4.15	2.72	YES	All	YES	15.0	Impacted
LW03-SD547-00-10C	9/7/2010	547	Near Shore	22	525	2.26	129	1.21	29.8	1.12	22.5	2.01	687	1.68	1.66	YES	Cu, Sn, Zn, Avg	YES	22.0	Impacted
LW03-SD553-00-10C	9/7/2010	553	Near Shore	30	212	0.91	69.5	0.65	26.3	0.99	14.7	1.31	469	1.14	1.00	YES	Avg	YES	30.0	Impacted
LW03-SD559-00-10C	9/7/2010	559	Near Shore	18	127	0.55	140	1.31	15.6	0.59	6.66	0.59	302	0.74	0.76	NO	--	YES	18.0	Possibly impacted
LW03-SD510-00-10C	8/31/2010	510	Offshore	0.5	93.6	0.40	38.5	0.36	16.6	0.63	6.05	0.54	187	0.46	0.48	NO	--	NO	--	Unimpacted
LW03-SD511-00-10C	8/31/2010	511	Offshore	0.8	97.4	0.42	66.3	0.62	18.5	0.70	14.0	1.25	248	0.60	0.72	NO	--	NO	--	Unimpacted
LW03-SD512-00-10C	9/2/2010	512	Offshore	0.3	96.3	0.42	69.0	0.64	16.5	0.62	13.3	1.19	243	0.59	0.69	NO	--	NO	--	Unimpacted
LW03-SD517-00-10C	8/31/2010	517	Offshore	0.25	245	1.06	58.1	0.54	25.7	0.97	9.08	0.81	328	0.80	0.84	NO	--	NO	--	Unimpacted
LW03-SD518-00-10C	8/31/2010	518	Offshore	0.2	173	0.75	61.9	0.58	24.1	0.91	7.50	0.67	293	0.71	0.72	NO	--	NO	--	Unimpacted
LW03-SD528-00-10C	9/9/2010	528	Offshore	No data	323	1.39	250	2.34	33.6	1.27	27.9	2.49	616	1.50	1.80	YES	Pb, Sn, Zn, Avg	--	No data	Impacted
LW03-SD533-00-10C	9/1/2010	533	Offshore	5.0	237	1.02	167	1.56	52.2	1.97	34.2	3.05	673	1.64	1.85	YES	All but Cu	YES	5.00	Impacted
LW03-SD537-00-10C	9/1/2010	537	Offshore	3.0	231	1.00	179	1.67	27.8	1.05	15.5	1.38	1,030	2.51	1.52	YES	Pb, Zn, Avg	YES	3.00	Impacted
LW03-SD540-00-10C	9/1/2010	540	Offshore	4.0	334	1.44	238	2.22	63.0	2.38	40.0	3.57	852	2.08	2.34	YES	All but Cu	YES	4.00	Impacted
LW03-SD543-00-10C	9/1/2010	543	Offshore	1.5	151	0.65	62.3	0.58	28.0	1.06	9.35	0.83	344	0.84	0.79	NO	--	YES	1.50	Possibly impacted
LW03-SD545-00-10C	9/1/2010	545	Offshore	2.0	230	0.99	158	1.48	33.3	1.26	17.0	1.52	433	1.06	1.26	YES	Sn, Avg	YES	2.00	Impacted
LW03-SD546-00-10C	9/1/2010	546	Offshore	3.0	197	0.85	60.4	0.56	27.1	1.02	9.35	0.83	318	0.78	0.81	NO	--	YES	3.00	Possibly impacted
LW03-SD548-00-10C	9/9/2010	548	Offshore	0	161	0.69	55.1	0.51	26.9	1.02	8.31	0.74	340	0.83	0.76	NO	--	NO	--	Unimpacted
LW03-SD549-00-10C	9/9/2010	549	Offshore	0.01	218	0.94	126	1.18	36.8	1.39	22.0	1.96	595	1.45	1.38	YES	Sn, Avg	NO	--	Possibly impacted
LW03-SD550-00-10C	9/8/2010	550	Offshore	No data	53.1	0.23	16.4	0.15	8.72	0.33	2.89	0.26	102	0.25	0.24	NO	--	--	No data	Unimpacted

TABLE D-11  
Surface Sediment Screening for SWMU 3 COCs - 2010 Samples  
SWMU 3 Benthic Invertebrate Evaluation  
Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Sample	Date	Grid	Area	Percent ABM	Copper (MG/KG)	RQ	Lead (MG/KG)	RQ	Nickel (MG/KG)	RQ	Tin (MG/KG)	RQ	Zinc (MG/KG)	RQ	Average RQ	Fails RQ?	Reason for Failure	ABM > 1%?	Percent ABM	Classification
LW03-SD551-00-10C	9/8/2010	551	Offshore	0.3	110	0.47	167	1.56	23.3	0.88	7.97	0.71	258	0.63	0.85	YES	Pb	NO	--	Possibly impacted
LW03-SD552-00-10C	9/7/2010	552	Offshore	0.03	138	0.59	49.5	0.46	22.2	0.84	8.16	0.73	275	0.67	0.66	NO	--	NO	--	Unimpacted
LW03-SD555-00-10C	9/9/2010	555	Offshore	0.001	169	0.73	724	6.77	25.8	0.97	8.87	0.79	540	1.32	2.12	YES	Pb, Avg	NO	--	Possibly impacted
LW03-SD556-00-10C	9/8/2010	556	Offshore	0.02	167	0.72	93.4	0.87	24.6	0.93	11.3	1.01	377	0.92	0.89	NO	--	NO	--	Unimpacted
LW03-SD557-00-10C	9/8/2010	557	Offshore	0.03	145	0.63	50.2	0.47	27.8	1.05	8.89	0.79	302	0.74	0.73	NO	--	NO	--	Unimpacted
LW03-SD558-00-10C	9/8/2010	558	Offshore	0.4	201	0.87	76.6	0.72	34.3	1.29	16.6	1.48	449	1.10	1.09	YES	Avg	NO	--	Possibly impacted
LW03-SD562-00-10C	9/8/2010	562	Offshore	0.01	133	0.57	49.6	0.46	25.9	0.98	8.29	0.74	271	0.66	0.68	NO	--	NO	--	Unimpacted
LW03-SD563-00-10C	9/8/2010	563	Offshore	0.02	131	0.56	49.4	0.46	25.1	0.95	8.08	0.72	270	0.66	0.67	NO	--	NO	--	Unimpacted
LW03-SD564-00-10C	9/8/2010	564	Offshore	0.05	144	0.62	44.2	0.41	25.4	0.96	8.02	0.72	270	0.66	0.67	NO	--	NO	--	Unimpacted
LW03-SD567-00-10C	9/8/2010	567	Offshore	0.02	161	0.69	47.9	0.45	30.2	1.14	7.96	0.71	300	0.73	0.74	NO	--	NO	--	Unimpacted
LW03-SD571-00-10C	9/8/2010	571	Offshore	0.05	131	0.56	62.4	0.58	25.1	0.95	8.39	0.75	307	0.75	0.72	NO	--	NO	--	Unimpacted
LW03-SD574-00-10C	8/31/2010	574	Offshore	0.25	163	0.70	47.7	0.45	21.7	0.82	7.18	0.64	254	0.62	0.65	NO	--	NO	--	Unimpacted

Notes:  
Shaded cells = detects  
Unshaded cells = U or B (at full DL)

	RQ ≤ 1 or 1.5
	RQ > 1.5 (Ind)
	RQ > 1 (Avg)

	PRG	Basis
Copper	232	ABM
Lead	107	ABM
Nickel	26.5	Back
Tin	11.2	ABM
Zinc	410	ER-M

**TABLE D-12**

Statistical Summary of SWMU 3 Benthic Invertebrate Replicate Samples

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

<b>Metric</b>	<b>Sample</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Coefficient of Variation (percent)</b>	<b>Number of Replicates</b>	<b>Minimum Value</b>	<b>Median Value</b>	<b>Maximum Value</b>
Total Count	534	--	--	--	--	0	0	41
Total Count	550	--	--	--	--	0	1	2
Total Count	558	--	--	--	--	0	0	3
Number of Taxa (Taxa Richness)	534	5.00	8.66	173	3	0	0	15
Number of Taxa (Taxa Richness)	550	0.67	0.58	86.6	3	0	1	1
Number of Taxa (Taxa Richness)	558	1.00	1.73	173	3	0	0	3
Total Density	534	196	340	173	3	0	0	589
Total Density	550	14.4	14.4	100	3	0	14	29
Total Density	558	14.4	24.9	173	3	0	0	43

TABLE D-13

Correlations of Sediment/Water Column Properties and Benthic Invertebrates Metrics (2010 Samples)

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Parameter	Medium	Benthic Invertebrate Metric	Pearson (parametric)				Spearman (non-parametric)				Direction
			Correlation Coefficient	Probability		R <sup>2</sup>	Correlation Coefficient	Probability		R <sup>2</sup>	
Copper	Sediment	Number of Taxa (Taxa Richness)	0.467	1.66E-04	S	0.218	0.109	4.06E-01	NS	0.012	--
Lead	Sediment	Number of Taxa (Taxa Richness)	0.437	4.76E-04	S	0.191	0.293	2.33E-02	S	0.086	Positive
Nickel	Sediment	Number of Taxa (Taxa Richness)	0.441	4.19E-04	S	0.195	-0.185	1.57E-01	NS	0.034	--
Tin	Sediment	Number of Taxa (Taxa Richness)	0.470	1.49E-04	S	0.221	0.231	7.62E-02	NS	0.053	--
Zinc	Sediment	Number of Taxa (Taxa Richness)	0.434	5.24E-04	S	0.189	0.064	6.25E-01	NS	0.004	--
Average RQ	Sediment	Number of Taxa (Taxa Richness)	0.459	2.22E-04	S	0.211	0.137	2.95E-01	NS	0.019	(Positive)
Percent ABM	Sediment	Number of Taxa (Taxa Richness)	0.486	1.10E-04	S	0.236	0.424	8.97E-04	S	0.180	Positive
SEM/AVS Ratio	Sediment	Number of Taxa (Taxa Richness)	0.202	1.21E-01	NS	0.041	0.375	3.13E-03	S	0.141	--
Large Gravel	Sediment	Number of Taxa (Taxa Richness)	0.468	1.63E-04	S	0.219	0.322	1.22E-02	S	0.104	Positive
Coarse Gravel	Sediment	Number of Taxa (Taxa Richness)	0.301	1.94E-02	S	0.091	0.311	1.57E-02	S	0.097	Positive
Fine Gravel	Sediment	Number of Taxa (Taxa Richness)	0.590	6.97E-07	S	0.348	0.618	1.47E-07	S	0.381	Positive
Coarse Sand	Sediment	Number of Taxa (Taxa Richness)	0.537	9.67E-06	S	0.288	0.685	1.52E-09	S	0.470	Positive
Medium Sand	Sediment	Number of Taxa (Taxa Richness)	0.656	1.30E-08	S	0.430	0.678	2.57E-09	S	0.460	Positive
Fine Sand	Sediment	Number of Taxa (Taxa Richness)	0.463	1.96E-04	S	0.214	0.624	1.00E-07	S	0.389	Positive
Silt/Clay	Sediment	Number of Taxa (Taxa Richness)	-0.727	4.60E-11	S	0.529	-0.787	8.83E-14	S	0.620	Negative
Sediment pH	Sediment	Number of Taxa (Taxa Richness)	0.027	8.39E-01	NS	0.001	-0.048	7.17E-01	NS	0.002	--
TOC	Sediment	Number of Taxa (Taxa Richness)	-0.518	2.28E-05	S	0.268	-0.522	1.89E-05	S	0.272	Negative
Bottom Dissolved Oxygen	Water Column	Number of Taxa (Taxa Richness)	0.436	4.99E-04	S	0.190	0.585	9.21E-07	S	0.342	Positive
Bottom ORP	Water Column	Number of Taxa (Taxa Richness)	0.367	3.91E-03	S	0.135	0.474	1.28E-04	S	0.225	Positive
Bottom Salinity	Water Column	Number of Taxa (Taxa Richness)	-0.308	1.66E-02	S	0.095	-0.336	8.62E-03	S	0.113	Negative
Bottom Specific Conductivity	Water Column	Number of Taxa (Taxa Richness)	-0.303	1.88E-02	S	0.092	-0.330	9.91E-03	S	0.109	Negative
Bottom Temperature	Water Column	Number of Taxa (Taxa Richness)	0.081	5.40E-01	NS	0.007	0.077	5.65E-01	NS	0.006	--
Bottom Turbidity	Water Column	Number of Taxa (Taxa Richness)	-0.165	2.15E-01	NS	0.027	-0.330	1.15E-02	S	0.109	--
Bottom Water pH	Water Column	Number of Taxa (Taxa Richness)	0.232	7.51E-02	NS	0.054	0.326	1.09E-02	S	0.106	--
Water Depth	Water Column	Number of Taxa (Taxa Richness)	-0.673	7.36E-09	S	0.452	-0.750	1.25E-11	S	0.562	Negative
Copper	Sediment	Total Density (Number per Square Meter)	0.497	5.35E-05	S	0.247	0.133	3.09E-01	NS	0.018	--
Lead	Sediment	Total Density (Number per Square Meter)	0.448	3.27E-04	S	0.201	0.338	8.18E-03	S	0.115	Positive
Nickel	Sediment	Total Density (Number per Square Meter)	0.455	2.57E-04	S	0.207	-0.182	1.64E-01	NS	0.033	--
Tin	Sediment	Total Density (Number per Square Meter)	0.480	1.05E-04	S	0.230	0.255	4.91E-02	S	0.065	Positive
Zinc	Sediment	Total Density (Number per Square Meter)	0.427	6.67E-04	S	0.182	0.087	5.11E-01	NS	0.007	--
Average RQ	Sediment	Total Density (Number per Square Meter)	0.469	1.57E-04	S	0.220	0.174	1.84E-01	NS	0.030	(Positive)
Percent ABM	Sediment	Total Density (Number per Square Meter)	0.419	1.07E-03	S	0.175	0.407	1.53E-03	S	0.165	Positive
SEM/AVS Ratio	Sediment	Total Density (Number per Square Meter)	0.074	5.72E-01	NS	0.006	0.327	1.08E-02	S	0.107	--
Large Gravel	Sediment	Total Density (Number per Square Meter)	0.338	8.33E-03	S	0.114	0.281	2.94E-02	S	0.079	Positive
Coarse Gravel	Sediment	Total Density (Number per Square Meter)	0.329	1.03E-02	S	0.108	0.284	2.76E-02	S	0.081	Positive

**TABLE D-13**

Correlations of Sediment/Water Column Properties and Benthic Invertebrates Metrics (2010 Samples)

*SWMU 3 Benthic Invertebrate Evaluation**Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Parameter	Medium	Benthic Invertebrate Metric	Pearson (parametric)				Spearman (non-parametric)				Direction
			Correlation Coefficient	Probability		R²	Correlation Coefficient	Probability		R²	
Fine Gravel	Sediment	Total Density (Number per Square Meter)	0.546	6.38E-06	S	0.298	0.617	1.50E-07	S	0.381	Positive
Coarse Sand	Sediment	Total Density (Number per Square Meter)	0.588	7.73E-07	S	0.346	0.678	2.69E-09	S	0.460	Positive
Medium Sand	Sediment	Total Density (Number per Square Meter)	0.592	6.38E-07	S	0.350	0.664	7.33E-09	S	0.441	Positive
Fine Sand	Sediment	Total Density (Number per Square Meter)	0.330	1.01E-02	S	0.109	0.605	3.03E-07	S	0.366	Positive
Silt/Clay	Sediment	Total Density (Number per Square Meter)	-0.601	3.80E-07	S	0.361	-0.765	1.17E-12	S	0.584	Negative
Sediment pH	Sediment	Total Density (Number per Square Meter)	0.037	7.80E-01	NS	0.001	-0.098	4.58E-01	NS	0.010	--
TOC	Sediment	Total Density (Number per Square Meter)	-0.476	1.20E-04	S	0.227	-0.539	8.88E-06	S	0.290	Negative
Bottom Dissolved Oxygen	Water Column	Total Density (Number per Square Meter)	0.352	5.87E-03	S	0.124	0.574	1.62E-06	S	0.330	Positive
Bottom ORP	Water Column	Total Density (Number per Square Meter)	0.360	4.70E-03	S	0.130	0.493	6.28E-05	S	0.243	Positive
Bottom Salinity	Water Column	Total Density (Number per Square Meter)	-0.359	4.82E-03	S	0.129	-0.352	5.85E-03	S	0.124	Negative
Bottom Specific Conductivity	Water Column	Total Density (Number per Square Meter)	-0.355	5.33E-03	S	0.126	-0.348	6.43E-03	S	0.121	Negative
Bottom Temperature	Water Column	Total Density (Number per Square Meter)	0.011	9.34E-01	NS	0.0001	-0.009	9.44E-01	NS	0.0001	--
Bottom Turbidity	Water Column	Total Density (Number per Square Meter)	-0.134	3.17E-01	NS	0.018	-0.302	2.11E-02	S	0.091	--
Bottom Water pH	Water Column	Total Density (Number per Square Meter)	0.184	1.58E-01	NS	0.034	0.302	1.90E-02	S	0.091	--
Water Depth	Water Column	Total Density (Number per Square Meter)	-0.532	1.70E-05	S	0.283	-0.711	3.93E-10	S	0.506	Negative

S - Significant ( $p \leq 0.05$ ); NS - Not Significant ( $p > 0.05$ )R<sup>2</sup> - represents the percentage of variability explained

TABLE D-14

Significant Correlations of Sediment/Water Column Properties and Benthic Invertebrates Metrics (2010 Samples)

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Parameter	Medium	Benthic Invertebrate Metric	Pearson (parametric)				Spearman (non-parametric)				Direction
			Correlation Coefficient	Probability		R²	Correlation Coefficient	Probability		R²	
Sorted by Benthic Invertebrate Metric											
Copper	Sediment	Number of Taxa (Taxa Richness)	0.467	1.66E-04	S	0.218	0.109	4.06E-01	NS	0.012	--
Lead	Sediment	Number of Taxa (Taxa Richness)	0.437	4.76E-04	S	0.191	0.293	2.33E-02	S	0.086	Positive
Nickel	Sediment	Number of Taxa (Taxa Richness)	0.441	4.19E-04	S	0.195	-0.185	1.57E-01	NS	0.034	--
Tin	Sediment	Number of Taxa (Taxa Richness)	0.470	1.49E-04	S	0.221	0.231	7.62E-02	NS	0.053	--
Zinc	Sediment	Number of Taxa (Taxa Richness)	0.434	5.24E-04	S	0.189	0.064	6.25E-01	NS	0.004	--
Average RQ	Sediment	Number of Taxa (Taxa Richness)	0.459	2.22E-04	S	0.211	0.137	2.95E-01	NS	0.019	(Positive)
Percent ABM	Sediment	Number of Taxa (Taxa Richness)	0.486	1.10E-04	S	0.236	0.424	8.97E-04	S	0.180	Positive
SEM/AVS Ratio	Sediment	Number of Taxa (Taxa Richness)	0.202	1.21E-01	NS	0.041	0.375	3.13E-03	S	0.141	--
Large Gravel	Sediment	Number of Taxa (Taxa Richness)	0.468	1.63E-04	S	0.219	0.322	1.22E-02	S	0.104	Positive
Coarse Gravel	Sediment	Number of Taxa (Taxa Richness)	0.301	1.94E-02	S	0.091	0.311	1.57E-02	S	0.097	Positive
Fine Gravel	Sediment	Number of Taxa (Taxa Richness)	0.590	6.97E-07	S	0.348	0.618	1.47E-07	S	0.381	Positive
Coarse Sand	Sediment	Number of Taxa (Taxa Richness)	0.537	9.67E-06	S	0.288	0.685	1.52E-09	S	0.470	Positive
Medium Sand	Sediment	Number of Taxa (Taxa Richness)	0.656	1.30E-08	S	0.430	0.678	2.57E-09	S	0.460	Positive
Fine Sand	Sediment	Number of Taxa (Taxa Richness)	0.463	1.96E-04	S	0.214	0.624	1.00E-07	S	0.389	Positive
Silt/Clay	Sediment	Number of Taxa (Taxa Richness)	-0.727	4.60E-11	S	0.529	-0.787	8.83E-14	S	0.620	Negative
TOC	Sediment	Number of Taxa (Taxa Richness)	-0.518	2.28E-05	S	0.268	-0.522	1.89E-05	S	0.272	Negative
Bottom Dissolved Oxygen	Water Column	Number of Taxa (Taxa Richness)	0.436	4.99E-04	S	0.190	0.585	9.21E-07	S	0.342	Positive
Bottom ORP	Water Column	Number of Taxa (Taxa Richness)	0.367	3.91E-03	S	0.135	0.474	1.28E-04	S	0.225	Positive
Bottom Salinity	Water Column	Number of Taxa (Taxa Richness)	-0.308	1.66E-02	S	0.095	-0.336	8.62E-03	S	0.113	Negative
Bottom Specific Conductivity	Water Column	Number of Taxa (Taxa Richness)	-0.303	1.88E-02	S	0.092	-0.330	9.91E-03	S	0.109	Negative
Bottom Turbidity	Water Column	Number of Taxa (Taxa Richness)	-0.165	2.15E-01	NS	0.027	-0.330	1.15E-02	S	0.109	--
Bottom Water pH	Water Column	Number of Taxa (Taxa Richness)	0.232	7.51E-02	NS	0.054	0.326	1.09E-02	S	0.106	--
Water Depth	Water Column	Number of Taxa (Taxa Richness)	-0.673	7.36E-09	S	0.452	-0.750	1.25E-11	S	0.562	Negative
Copper	Sediment	Total Density (Number per Square Meter)	0.497	5.35E-05	S	0.247	0.133	3.09E-01	NS	0.018	--
Lead	Sediment	Total Density (Number per Square Meter)	0.448	3.27E-04	S	0.201	0.338	8.18E-03	S	0.115	Positive
Nickel	Sediment	Total Density (Number per Square Meter)	0.455	2.57E-04	S	0.207	-0.182	1.64E-01	NS	0.033	--
Tin	Sediment	Total Density (Number per Square Meter)	0.480	1.05E-04	S	0.230	0.255	4.91E-02	S	0.065	Positive
Zinc	Sediment	Total Density (Number per Square Meter)	0.427	6.67E-04	S	0.182	0.087	5.11E-01	NS	0.007	--
Average RQ	Sediment	Total Density (Number per Square Meter)	0.469	1.57E-04	S	0.220	0.174	1.84E-01	NS	0.030	(Positive)
Percent ABM	Sediment	Total Density (Number per Square Meter)	0.419	1.07E-03	S	0.175	0.407	1.53E-03	S	0.165	Positive
SEM/AVS Ratio	Sediment	Total Density (Number per Square Meter)	0.074	5.72E-01	NS	0.006	0.327	1.08E-02	S	0.107	--
Large Gravel	Sediment	Total Density (Number per Square Meter)	0.338	8.33E-03	S	0.114	0.281	2.94E-02	S	0.079	Positive
Coarse Gravel	Sediment	Total Density (Number per Square Meter)	0.329	1.03E-02	S	0.108	0.284	2.76E-02	S	0.081	Positive
Fine Gravel	Sediment	Total Density (Number per Square Meter)	0.546	6.38E-06	S	0.298	0.617	1.50E-07	S	0.381	Positive



TABLE D-14

Significant Correlations of Sediment/Water Column Properties and Benthic Invertebrates Metrics (2010 Samples)

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Parameter	Medium	Benthic Invertebrate Metric	Pearson (parametric)				Spearman (non-parametric)				Direction
			Correlation Coefficient	Probability		R²	Correlation Coefficient	Probability		R²	
Coarse Sand	Sediment	Total Density (Number per Square Meter)	0.588	7.73E-07	S	0.346	0.678	2.69E-09	S	0.460	Positive
Medium Sand	Sediment	Total Density (Number per Square Meter)	0.592	6.38E-07	S	0.350	0.664	7.33E-09	S	0.441	Positive
Fine Sand	Sediment	Total Density (Number per Square Meter)	0.330	1.01E-02	S	0.109	0.605	3.03E-07	S	0.366	Positive
Silt/Clay	Sediment	Total Density (Number per Square Meter)	-0.601	3.80E-07	S	0.361	-0.765	1.17E-12	S	0.584	Negative
TOC	Sediment	Total Density (Number per Square Meter)	-0.476	1.20E-04	S	0.227	-0.539	8.88E-06	S	0.290	Negative
Bottom Dissolved Oxygen	Water Column	Total Density (Number per Square Meter)	0.352	5.87E-03	S	0.124	0.574	1.62E-06	S	0.330	Positive
Bottom ORP	Water Column	Total Density (Number per Square Meter)	0.360	4.70E-03	S	0.130	0.493	6.28E-05	S	0.243	Positive
Bottom Salinity	Water Column	Total Density (Number per Square Meter)	-0.359	4.82E-03	S	0.129	-0.352	5.85E-03	S	0.124	Negative
Bottom Specific Conductivity	Water Column	Total Density (Number per Square Meter)	-0.355	5.33E-03	S	0.126	-0.348	6.43E-03	S	0.121	Negative
Bottom Turbidity	Water Column	Total Density (Number per Square Meter)	-0.134	3.17E-01	NS	0.018	-0.302	2.11E-02	S	0.091	--
Bottom Water pH	Water Column	Total Density (Number per Square Meter)	0.184	1.58E-01	NS	0.034	0.302	1.90E-02	S	0.091	--
Water Depth	Water Column	Total Density (Number per Square Meter)	-0.532	1.70E-05	S	0.283	-0.711	3.93E-10	S	0.506	Negative
Sorted by Water/Sediment Parameter											
Average RQ	Sediment	Number of Taxa (Taxa Richness)	0.459	2.22E-04	S	0.211	0.137	2.95E-01	NS	0.019	(Positive)
Average RQ	Sediment	Total Density (Number per Square Meter)	0.469	1.57E-04	S	0.220	0.174	1.84E-01	NS	0.030	(Positive)
Bottom Dissolved Oxygen	Water Column	Number of Taxa (Taxa Richness)	0.436	4.99E-04	S	0.190	0.585	9.21E-07	S	0.342	Positive
Bottom Dissolved Oxygen	Water Column	Total Density (Number per Square Meter)	0.352	5.87E-03	S	0.124	0.574	1.62E-06	S	0.330	Positive
Bottom ORP	Water Column	Number of Taxa (Taxa Richness)	0.367	3.91E-03	S	0.135	0.474	1.28E-04	S	0.225	Positive
Bottom ORP	Water Column	Total Density (Number per Square Meter)	0.360	4.70E-03	S	0.130	0.493	6.28E-05	S	0.243	Positive
Bottom Salinity	Water Column	Number of Taxa (Taxa Richness)	-0.308	1.66E-02	S	0.095	-0.336	8.62E-03	S	0.113	Negative
Bottom Salinity	Water Column	Total Density (Number per Square Meter)	-0.359	4.82E-03	S	0.129	-0.352	5.85E-03	S	0.124	Negative
Bottom Specific Conductivity	Water Column	Number of Taxa (Taxa Richness)	-0.303	1.88E-02	S	0.092	-0.330	9.91E-03	S	0.109	Negative
Bottom Specific Conductivity	Water Column	Total Density (Number per Square Meter)	-0.355	5.33E-03	S	0.126	-0.348	6.43E-03	S	0.121	Negative
Bottom Turbidity	Water Column	Number of Taxa (Taxa Richness)	-0.165	2.15E-01	NS	0.027	-0.330	1.15E-02	S	0.109	--
Bottom Turbidity	Water Column	Total Density (Number per Square Meter)	-0.134	3.17E-01	NS	0.018	-0.302	2.11E-02	S	0.091	--
Bottom Water pH	Water Column	Number of Taxa (Taxa Richness)	0.232	7.51E-02	NS	0.054	0.326	1.09E-02	S	0.106	--
Bottom Water pH	Water Column	Total Density (Number per Square Meter)	0.184	1.58E-01	NS	0.034	0.302	1.90E-02	S	0.091	--
Coarse Gravel	Sediment	Number of Taxa (Taxa Richness)	0.301	1.94E-02	S	0.091	0.311	1.57E-02	S	0.097	Positive
Coarse Gravel	Sediment	Total Density (Number per Square Meter)	0.329	1.03E-02	S	0.108	0.284	2.76E-02	S	0.081	Positive
Coarse Sand	Sediment	Number of Taxa (Taxa Richness)	0.537	9.67E-06	S	0.288	0.685	1.52E-09	S	0.470	Positive
Coarse Sand	Sediment	Total Density (Number per Square Meter)	0.588	7.73E-07	S	0.346	0.678	2.69E-09	S	0.460	Positive
Copper	Sediment	Number of Taxa (Taxa Richness)	0.467	1.66E-04	S	0.218	0.109	4.06E-01	NS	0.012	--
Copper	Sediment	Total Density (Number per Square Meter)	0.497	5.35E-05	S	0.247	0.133	3.09E-01	NS	0.018	--
Fine Gravel	Sediment	Number of Taxa (Taxa Richness)	0.590	6.97E-07	S	0.348	0.618	1.47E-07	S	0.381	Positive
Fine Gravel	Sediment	Total Density (Number per Square Meter)	0.546	6.38E-06	S	0.298	0.617	1.50E-07	S	0.381	Positive

TABLE D-14

Significant Correlations of Sediment/Water Column Properties and Benthic Invertebrates Metrics (2010 Samples)

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Parameter	Medium	Benthic Invertebrate Metric	Pearson (parametric)				Spearman (non-parametric)				Direction
			Correlation Coefficient	Probability		R²	Correlation Coefficient	Probability		R²	
Fine Sand	Sediment	Number of Taxa (Taxa Richness)	0.463	1.96E-04	S	0.214	0.624	1.00E-07	S	0.389	Positive
Fine Sand	Sediment	Total Density (Number per Square Meter)	0.330	1.01E-02	S	0.109	0.605	3.03E-07	S	0.366	Positive
Large Gravel	Sediment	Number of Taxa (Taxa Richness)	0.468	1.63E-04	S	0.219	0.322	1.22E-02	S	0.104	Positive
Large Gravel	Sediment	Total Density (Number per Square Meter)	0.338	8.33E-03	S	0.114	0.281	2.94E-02	S	0.079	Positive
Lead	Sediment	Number of Taxa (Taxa Richness)	0.437	4.76E-04	S	0.191	0.293	2.33E-02	S	0.086	Positive
Lead	Sediment	Total Density (Number per Square Meter)	0.448	3.27E-04	S	0.201	0.338	8.18E-03	S	0.115	Positive
Medium Sand	Sediment	Number of Taxa (Taxa Richness)	0.656	1.30E-08	S	0.430	0.678	2.57E-09	S	0.460	Positive
Medium Sand	Sediment	Total Density (Number per Square Meter)	0.592	6.38E-07	S	0.350	0.664	7.33E-09	S	0.441	Positive
Nickel	Sediment	Number of Taxa (Taxa Richness)	0.441	4.19E-04	S	0.195	-0.185	1.57E-01	NS	0.034	--
Nickel	Sediment	Total Density (Number per Square Meter)	0.455	2.57E-04	S	0.207	-0.182	1.64E-01	NS	0.033	--
Percent ABM	Sediment	Number of Taxa (Taxa Richness)	0.486	1.10E-04	S	0.236	0.424	8.97E-04	S	0.180	Positive
Percent ABM	Sediment	Total Density (Number per Square Meter)	0.419	1.07E-03	S	0.175	0.407	1.53E-03	S	0.165	Positive
SEM/AVS Ratio	Sediment	Number of Taxa (Taxa Richness)	0.202	1.21E-01	NS	0.041	0.375	3.13E-03	S	0.141	--
SEM/AVS Ratio	Sediment	Total Density (Number per Square Meter)	0.074	5.72E-01	NS	0.006	0.327	1.08E-02	S	0.107	--
Silt/Clay	Sediment	Number of Taxa (Taxa Richness)	-0.727	4.60E-11	S	0.529	-0.787	8.83E-14	S	0.620	Negative
Silt/Clay	Sediment	Total Density (Number per Square Meter)	-0.601	3.80E-07	S	0.361	-0.765	1.17E-12	S	0.584	Negative
Tin	Sediment	Number of Taxa (Taxa Richness)	0.470	1.49E-04	S	0.221	0.231	7.62E-02	NS	0.053	--
Tin	Sediment	Total Density (Number per Square Meter)	0.480	1.05E-04	S	0.230	0.255	4.91E-02	S	0.065	Positive
TOC	Sediment	Number of Taxa (Taxa Richness)	-0.518	2.28E-05	S	0.268	-0.522	1.89E-05	S	0.272	Negative
TOC	Sediment	Total Density (Number per Square Meter)	-0.476	1.20E-04	S	0.227	-0.539	8.88E-06	S	0.290	Negative
Water Depth	Water Column	Number of Taxa (Taxa Richness)	-0.673	7.36E-09	S	0.452	-0.750	1.25E-11	S	0.562	Negative
Water Depth	Water Column	Total Density (Number per Square Meter)	-0.532	1.70E-05	S	0.283	-0.711	3.93E-10	S	0.506	Negative
Zinc	Sediment	Number of Taxa (Taxa Richness)	0.434	5.24E-04	S	0.189	0.064	6.25E-01	NS	0.004	--
Zinc	Sediment	Total Density (Number per Square Meter)	0.427	6.67E-04	S	0.182	0.087	5.11E-01	NS	0.007	--

S - Significant ( $p \leq 0.05$ ); NS - Not Significant ( $p > 0.05$ )R<sup>2</sup> - represents the percentage of variability explained



TABLE D-15

Correlations of Among Key Sediment Parameters, Water Column Parameters, and Benthic Invertebrates Metrics (2010 Samples)

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Parameter	Parameter	Pearson (parametric)				Spearman (non-parametric)				Direction
		Correlation Coefficient	Probability		R <sup>2</sup>	Correlation Coefficient	Probability		R <sup>2</sup>	
Average RQ	Percent ABM	0.693	1.63E-09	S	0.481	0.532	1.70E-05	S	0.283	Positive
Average RQ	Silt/Clay	-0.338	8.31E-03	S	0.114	-0.102	4.40E-01	NS	0.010	--
Average RQ	Total Organic Carbon	-0.283	2.83E-02	S	0.080	0.052	6.96E-01	NS	0.003	--
Average RQ	Bottom Dissolved Oxygen	0.109	4.06E-01	NS	0.012	0.143	2.75E-01	NS	0.021	--
Average RQ	Water Depth	-0.305	1.99E-02	S	0.093	-0.089	5.04E-01	NS	0.008	--
Percent ABM	Average RQ	0.693	1.63E-09	S	0.481	0.532	1.70E-05	S	0.283	Positive
Percent ABM	Silt/Clay	-0.501	6.30E-05	S	0.251	-0.485	1.12E-04	S	0.236	Negative
Percent ABM	Total Organic Carbon	-0.208	1.18E-01	NS	0.043	-0.231	8.15E-02	NS	0.053	--
Percent ABM	Bottom Dissolved Oxygen	0.240	6.99E-02	NS	0.057	0.224	9.11E-02	NS	0.050	--
Percent ABM	Water Depth	-0.443	6.24E-04	S	0.196	-0.399	2.29E-03	S	0.160	Negative
Silt/Clay	Average RQ	-0.338	8.31E-03	S	0.114	-0.102	4.40E-01	NS	0.010	--
Silt/Clay	Percent ABM	-0.501	6.30E-05	S	0.251	-0.485	1.12E-04	S	0.236	Negative
Silt/Clay	Total Organic Carbon	0.689	1.12E-09	S	0.475	0.642	3.31E-08	S	0.412	Positive
Silt/Clay	Bottom Dissolved Oxygen	-0.386	2.32E-03	S	0.149	-0.487	8.02E-05	S	0.237	Negative
Silt/Clay	Water Depth	0.699	1.05E-09	S	0.489	0.727	9.93E-11	S	0.529	Positive
Total Organic Carbon	Average RQ	-0.283	2.83E-02	S	0.080	0.052	6.96E-01	NS	0.003	--
Total Organic Carbon	Percent ABM	-0.208	1.18E-01	NS	0.043	-0.231	8.15E-02	NS	0.053	--
Total Organic Carbon	Silt/Clay	0.689	1.12E-09	S	0.475	0.642	3.31E-08	S	0.412	Positive
Total Organic Carbon	Bottom Dissolved Oxygen	-0.287	2.64E-02	S	0.082	-0.267	3.94E-02	S	0.071	Negative
Total Organic Carbon	Water Depth	0.613	3.17E-07	S	0.376	0.577	2.15E-06	S	0.333	Positive
Bottom Dissolved Oxygen	Average RQ	0.109	4.06E-01	NS	0.012	0.143	2.75E-01	NS	0.021	--
Bottom Dissolved Oxygen	Percent ABM	0.240	6.99E-02	NS	0.057	0.224	9.11E-02	NS	0.050	--
Bottom Dissolved Oxygen	Silt/Clay	-0.386	2.32E-03	S	0.149	-0.487	8.02E-05	S	0.237	Negative
Bottom Dissolved Oxygen	Total Organic Carbon	-0.287	2.64E-02	S	0.082	-0.267	3.94E-02	S	0.071	Negative
Bottom Dissolved Oxygen	Water Depth	-0.692	1.84E-09	S	0.478	-0.608	4.11E-07	S	0.370	Negative
Water Depth	Average RQ	-0.305	1.99E-02	S	0.093	-0.089	5.04E-01	NS	0.008	--
Water Depth	Percent ABM	-0.443	6.24E-04	S	0.196	-0.399	2.29E-03	S	0.160	Negative
Water Depth	Silt/Clay	0.699	1.05E-09	S	0.489	0.727	9.93E-11	S	0.529	Positive
Water Depth	Total Organic Carbon	0.613	3.17E-07	S	0.376	0.577	2.15E-06	S	0.333	Positive
Water Depth	Bottom Dissolved Oxygen	-0.692	1.84E-09	S	0.478	-0.608	4.11E-07	S	0.370	Negative
Total Density	Number of Taxa	0.915	1.58E-24	S	0.837	0.978	4.18E-41	S	0.956	Positive

S - Significant ( $p \leq 0.05$ ); NS - Not Significant ( $p > 0.05$ )R<sup>2</sup> - represents the percentage of variability explained

TABLE D-16

Multivariate Regression Evaluation of 2010 Benthic Invertebrate Metrics

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

	Dependent Variable	Method	R <sup>2</sup>	Adjusted R <sup>2</sup>	Intercept	Average RQ	Percent ABM	Silt/Clay	Total Organic Carbon	Bottom Dissolved Oxygen	Water Depth
Coefficients	Number of Taxa (Taxa Richness)	Stepwise	0.631	0.610	21.1	0.53		-0.14			-0.42
Probabilities		Stepwise		<b>6.52E-03</b>	<b>1.07E-12</b>	<b>1.97E-02</b>		<b>4.18E-04</b>			<b>1.62E-02</b>
Order Added		Stepwise				3		1			2
Coefficients	Number of Taxa (Taxa Richness)	Backward	0.631	0.610	21.1	0.53		-0.14			-0.42
Probabilities		Backward		<b>6.52E-03</b>	<b>1.07E-12</b>	<b>1.97E-02</b>		<b>4.18E-04</b>			<b>1.62E-02</b>
Order Removed		Backward					1		2	3	
Coefficients	Number of Taxa (Taxa Richness)	Forward	0.637	0.608	16.7	0.56		-0.14		0.65	-0.30
Probabilities		Forward		<b>1.12E-02</b>	<b>3.49E-03</b>	<b>1.61E-02</b>		<b>3.36E-04</b>		3.82E-01	1.77E-01
Order Added		Forward				3		1		4	2
Coefficients	Number of Taxa (Taxa Richness)	None	0.643	0.600	17.6	0.72	-0.10	-0.16	0.00008	0.59	-0.37
Probabilities		None		<b>1.22E-02</b>	<b>2.88E-03</b>	<b>2.33E-02</b>	4.46E-01	<b>5.97E-04</b>	4.22E-01	4.37E-01	1.23E-01
Coefficients	Total Density	Stepwise	0.443	0.422	807	44.9		-9.28			
Probabilities		Stepwise		<b>1.70E-06</b>	<b>2.22E-07</b>	<b>8.69E-03</b>		<b>2.48E-05</b>			
Order Added		Stepwise				2		1			
Coefficients	Total Density	Backward	0.443	0.422	807	44.9		-9.28			
Probabilities		Backward		<b>1.70E-06</b>	<b>2.22E-07</b>	<b>8.69E-03</b>		<b>2.48E-05</b>			
Order Removed		Backward					3		1	4	2
Coefficients	Total Density	Forward	0.472	0.430	516	56.7	-6.86	-8.62		65.0	
Probabilities		Forward		<b>1.01E-06</b>	5.54E-02	<b>1.11E-02</b>	4.32E-01	<b>4.33E-04</b>		1.31E-01	
Order Added		Forward				2	4	1		3	
Coefficients	Total Density	None	0.475	0.410	683	55.3	-6.87	-7.63	-0.0006	47.0	-8.43
Probabilities		None		<b>2.12E-06</b>	1.08E-01	<b>1.98E-02</b>	4.80E-01	<b>2.54E-02</b>	9.40E-01	4.03E-01	6.29E-01

Probability values in bold are significant ( $p \leq 0.05$ )

TABLE D-17

Spatial Comparison of the Nearshore, Marine, Offshore, and Dry Dock Areas - 2010 data:

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Metric/Parameter	Kruskal-Wallis (ranks)						Analysis of Variance (values)									
	Probability	Decision	Near Shore	Marina	Offshore	Dry Dock	Probability	Decision	Near Shore	Mean	Marina	Mean	Offshore	Mean	Dry Dock	Mean
Number of Taxa	1.39E-09	Different	A	AB	BC	C	9.69E-08	Different	A	15.7	AB	8.82	B	2.28	B	0.0
Total Density	2.30E-08	Different	A	AB	BC	C	1.53E-04	Different	A	737	AB	457	B	81.4	B	0.0
Average RQ	8.46E-01		A	A	A	A	1.80E-01		A	3.19	A	1.10	A	0.98	A	0.76
Percent ABM	1.56E-03	Different	A	A	A	A	4.03E-04	Different	A	12.3	AB	2.44	AB	0.87	B	0.67
Silt/Clay	1.24E-10	Different	A	B	BC	C	1.79E-11	Different	A	24.2	B	54.7	BC	74.9	C	85.3
Total Organic Carbon	5.66E-03	Different	A	A	AB	B	2.95E-03	Different	A	16,936	AB	25,085	AB	26,956	B	39,567
Bottom Dissolved Oxygen	6.82E-04	Different	A	A	A	B	4.51E-06	Different	A	4.65	A	4.87	A	3.99	B	0.65
Water Depth	7.24E-10	Different	A	AB	B	C	9.00E-10	Different	A	10.4	AB	14.2	B	18.5	C	29.0

TABLE D-18

Correlations of Among Key Sediment Parameters, Water Column Parameters, and Benthic Invertebrates Metrics (2010 Samples) by Area

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Area	Parameter	Parameter	Number of Samples	Pearson (parametric)				Spearman (non-parametric)				Direction
				Correlation Coefficient	Probability		R <sup>2</sup>	Correlation Coefficient	Probability		R <sup>2</sup>	
Dry Dock	Number of Taxa	Average RQ	3	--	--	--	--	--	--	--	--	N/A
Marina	Number of Taxa	Average RQ	11	0.793	0.004	S	0.629	0.749	0.008	S	0.561	Positive
Near Shore	Number of Taxa	Average RQ	19	0.465	0.045	S	0.217	0.042	0.864	NS	0.002	Positive
Offshore	Number of Taxa	Average RQ	27	-0.117	0.561	NS	0.014	0.047	0.816	NS	0.002	--
Dry Dock	Number of Taxa	Percent ABM	3	--	--	--	--	--	--	--	--	N/A
Marina	Number of Taxa	Percent ABM	11	0.699	0.017	S	0.489	0.793	0.004	S	0.629	Positive
Near Shore	Number of Taxa	Percent ABM	19	0.230	0.343	NS	0.053	0.107	0.663	NS	0.011	--
Offshore	Number of Taxa	Percent ABM	25	-0.061	0.772	NS	0.004	0.028	0.895	NS	0.001	--
Dry Dock	Number of Taxa	Silt/Clay	3	--	--	--	--	--	--	--	--	N/A
Marina	Number of Taxa	Silt/Clay	11	-0.464	0.150	NS	0.215	-0.543	0.084	NS	0.295	--
Near Shore	Number of Taxa	Silt/Clay	19	-0.420	0.073	NS	0.177	-0.532	0.019	S	0.283	Negative
Offshore	Number of Taxa	Silt/Clay	27	-0.657	0.0002	S	0.431	-0.589	0.001	S	0.347	Negative
Dry Dock	Number of Taxa	Total Organic Carbon	3	--	--	--	--	--	--	--	--	N/A
Marina	Number of Taxa	Total Organic Carbon	11	-0.311	0.351	NS	0.097	-0.406	0.215	NS	0.165	--
Near Shore	Number of Taxa	Total Organic Carbon	19	-0.337	0.159	NS	0.113	-0.412	0.080	NS	0.170	--
Offshore	Number of Taxa	Total Organic Carbon	27	-0.543	0.003	S	0.295	-0.288	0.145	NS	0.083	Negative
Dry Dock	Number of Taxa	Bottom Dissolved Oxygen	3	--	--	--	--	--	--	--	--	N/A
Marina	Number of Taxa	Bottom Dissolved Oxygen	11	0.634	0.036	S	0.402	0.648	0.031	S	0.420	Positive
Near Shore	Number of Taxa	Bottom Dissolved Oxygen	19	0.346	0.147	NS	0.119	0.261	0.280	NS	0.068	--
Offshore	Number of Taxa	Bottom Dissolved Oxygen	27	0.280	0.157	NS	0.078	0.393	0.042	S	0.155	Positive
Dry Dock	Number of Taxa	Water Depth	3	--	--	--	--	--	--	--	--	N/A
Marina	Number of Taxa	Water Depth	11	-0.583	0.060	NS	0.340	-0.644	0.033	S	0.415	Negative
Near Shore	Number of Taxa	Water Depth	19	-0.441	0.059	NS	0.194	-0.433	0.064	NS	0.188	--
Offshore	Number of Taxa	Water Depth	25	-0.147	0.482	NS	0.022	-0.022	0.916	NS	0.000	--

TABLE D-18

Correlations of Among Key Sediment Parameters, Water Column Parameters, and Benthic Invertebrates Metrics (2010 Samples) by Area

SWMU 3 Benthic Invertebrate Evaluation

Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Area	Parameter	Parameter	Number of Samples	Pearson (parametric)				Spearman (non-parametric)				Direction
				Correlation Coefficient	Probability		R <sup>2</sup>	Correlation Coefficient	Probability		R <sup>2</sup>	
Dry Dock	Total Density	Average RQ	3	--	--	--	--	--	--	--	--	N/A
Marina	Total Density	Average RQ	11	0.663	0.026	S	0.439	0.670	0.024	S	0.449	Positive
Near Shore	Total Density	Average RQ	19	0.465	0.045	S	0.216	0.105	0.668	NS	0.011	Positive
Offshore	Total Density	Average RQ	27	-0.046	0.819	NS	0.002	0.100	0.621	NS	0.010	--
Dry Dock	Total Density	Percent ABM	3	--	--	--	--	--	--	--	--	N/A
Marina	Total Density	Percent ABM	11	0.321	0.336	NS	0.103	0.757	0.007	S	0.573	Positive
Near Shore	Total Density	Percent ABM	19	0.230	0.343	NS	0.053	0.135	0.582	NS	0.018	--
Offshore	Total Density	Percent ABM	25	-0.016	0.940	NS	0.000	-0.040	0.851	NS	0.002	--
Dry Dock	Total Density	Silt/Clay	3	--	--	--	--	--	--	--	--	N/A
Marina	Total Density	Silt/Clay	11	-0.203	0.549	NS	0.041	-0.415	0.205	NS	0.172	--
Near Shore	Total Density	Silt/Clay	19	-0.440	0.060	NS	0.193	-0.585	0.008	S	0.343	Negative
Offshore	Total Density	Silt/Clay	27	-0.606	0.001	S	0.367	-0.624	0.001	S	0.390	Negative
Dry Dock	Total Density	Total Organic Carbon	3	--	--	--	--	--	--	--	--	N/A
Marina	Total Density	Total Organic Carbon	11	-0.132	0.700	NS	0.017	-0.378	0.252	NS	0.143	--
Near Shore	Total Density	Total Organic Carbon	19	-0.400	0.090	NS	0.160	-0.499	0.030	S	0.249	Negative
Offshore	Total Density	Total Organic Carbon	27	-0.488	0.010	S	0.238	-0.278	0.160	NS	0.078	Negative
Dry Dock	Total Density	Bottom Dissolved Oxygen	3	--	--	--	--	--	--	--	--	N/A
Marina	Total Density	Bottom Dissolved Oxygen	11	0.486	0.130	NS	0.236	0.674	0.023	S	0.455	Positive
Near Shore	Total Density	Bottom Dissolved Oxygen	19	0.224	0.358	NS	0.050	0.189	0.438	NS	0.036	--
Offshore	Total Density	Bottom Dissolved Oxygen	27	0.275	0.164	NS	0.076	0.456	0.017	S	0.208	Positive
Dry Dock	Total Density	Water Depth	3	--	--	--	--	--	--	--	--	N/A
Marina	Total Density	Water Depth	11	-0.341	0.305	NS	0.116	-0.661	0.027	S	0.436	Negative
Near Shore	Total Density	Water Depth	19	-0.323	0.177	NS	0.105	-0.451	0.052	NS	0.204	--
Offshore	Total Density	Water Depth	25	-0.012	0.954	NS	0.000	-0.011	0.958	NS	0.000	--

S - Significant ( $p \leq 0.05$ ); NS - Not Significant ( $p > 0.05$ )R<sup>2</sup> - represents the percentage of variability explained

**TABLE D-19**

Benthic Invertebrate Metric Values (2010) for the SWMU 7B Connector Channel and SWMU 3

SWMU 3 Benthic Invertebrate Evaluation

*Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample	Date	Area	Number of Taxa	Exceeds Channel Minimum?	Exceeds Channel Mean?	Total Density	Exceeds Channel Minimum?	Exceeds Channel Mean?
<b>SWMU 7B Connector Channel (Reference)</b>								
LW07-B5-SD401-00-10C	9/12/2010	Channel	25	--	--	1,523	--	--
LW07-B7-SD401-00-10C	9/12/2010	Channel	50	--	--	4,583	--	--
LW07-D5-SD401-00-10C	9/11/2010	Channel	9	--	--	230	--	--
LW07-F3-SD401-00-10C	9/11/2010	Channel	20	--	--	1,034	--	--
LW07-F5-SD401-00-10C	9/12/2010	Channel	27	--	--	1,739	--	--
Channel Minimum			9	--	--	230	--	--
Channel Mean			26.2	--	--	1,822	--	--
Channel Maximum			50	--	--	4,583	--	--
<b>SWMU 3</b>								
LW03-SD538-00-10C	09/01/2010	Dry Dock	0	NO	NO	0	NO	NO
LW03-SD539-00-10C	09/01/2010	Dry Dock	0	NO	NO	0	NO	NO
LW03-SD544-00-10C	09/01/2010	Dry Dock	0	NO	NO	0	NO	NO
LW03-SD513-00-10C	09/10/2010	Marina	5	NO	NO	302	YES	NO
LW03-SD514-00-10C	09/10/2010	Marina	5	NO	NO	187	NO	NO
LW03-SD515-00-10C	09/09/2010	Marina	14	YES	NO	374	YES	NO
LW03-SD519-00-10C	09/02/2010	Marina	4	NO	NO	115	NO	NO
LW03-SD520-00-10C	09/10/2010	Marina	20	YES	NO	1,652	YES	NO
LW03-SD521-00-10C	09/12/2010	Marina	18	YES	NO	575	YES	NO
LW03-SD522-00-10C	09/09/2010	Marina	17	YES	NO	761	YES	NO
LW03-SD525-00-10C	09/02/2010	Marina	0	NO	NO	0	NO	NO
LW03-SD526-00-10C	09/10/2010	Marina	2	NO	NO	57	NO	NO
LW03-SD527-00-10C	09/12/2010	Marina	12	YES	NO	1,006	YES	NO
LW03-SD530-00-10C	09/02/2010	Marina	0	NO	NO	0	NO	NO
LW03-SD501-00-10C	09/02/2010	Near Shore	22	YES	NO	862	YES	NO
LW03-SD502-00-10C	09/02/2010	Near Shore	23	YES	NO	761	YES	NO
LW03-SD503-00-10C	09/02/2010	Near Shore	13	YES	NO	330	YES	NO
LW03-SD504-00-10C	08/30/2010	Near Shore	2	NO	NO	43	NO	NO

**TABLE D-19**

Benthic Invertebrate Metric Values (2010) for the SWMU 7B Connector Channel and SWMU 3

SWMU 3 Benthic Invertebrate Evaluation

*Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample	Date	Area	Number of Taxa	Exceeds Channel Minimum?	Exceeds Channel Mean?	Total Density	Exceeds Channel Minimum?	Exceeds Channel Mean?
LW03-SD504A-00-10C	08/31/2010	Near Shore	8	NO	NO	187	NO	NO
LW03-SD505-00-10C	08/31/2010	Near Shore	9	YES	NO	273	YES	NO
LW03-SD506-00-10C	09/10/2010	Near Shore	24	YES	NO	1,537	YES	NO
LW03-SD507-00-10C	09/02/2010	Near Shore	18	YES	NO	618	YES	NO
LW03-SD508-00-10C	09/10/2010	Near Shore	13	YES	NO	560	YES	NO
LW03-SD509-00-10C	09/09/2010	Near Shore	18	YES	NO	1,336	YES	NO
LW03-SD516-00-10C	09/09/2010	Near Shore	14	YES	NO	560	YES	NO
LW03-SD523-00-10C	09/09/2010	Near Shore	35	YES	YES	1,983	YES	YES
LW03-SD529-00-10C	09/09/2010	Near Shore	30	YES	YES	2,414	YES	YES
LW03-SD534-00-10C	09/01/2010	Near Shore	5.0	NO	NO	196	NO	NO
LW03-SD535-00-10C	09/01/2010	Near Shore	30	YES	YES	1,580	YES	NO
LW03-SD541-00-10C	09/07/2010	Near Shore	7	NO	NO	129	NO	NO
LW03-SD547-00-10C	09/07/2010	Near Shore	6	NO	NO	287	YES	NO
LW03-SD553-00-10C	09/07/2010	Near Shore	17	YES	NO	287	YES	NO
LW03-SD559-00-10C	09/07/2010	Near Shore	4	NO	NO	57	NO	NO
LW03-SD510-00-10C	08/31/2010	Offshore	10	YES	NO	388	YES	NO
LW03-SD511-00-10C	08/31/2010	Offshore	13	YES	NO	848	YES	NO
LW03-SD512-00-10C	09/02/2010	Offshore	6	NO	NO	129	NO	NO
LW03-SD517-00-10C	08/31/2010	Offshore	2	NO	NO	29	NO	NO
LW03-SD518-00-10C	08/31/2010	Offshore	3	NO	NO	57	NO	NO
LW03-SD528-00-10C	09/09/2010	Offshore	4	NO	NO	101	NO	NO
LW03-SD533-00-10C	09/01/2010	Offshore	4	NO	NO	144	NO	NO
LW03-SD537-00-10C	09/01/2010	Offshore	1	NO	NO	14	NO	NO
LW03-SD540-00-10C	09/01/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD543-00-10C	09/01/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD545-00-10C	09/01/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD546-00-10C	09/01/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD548-00-10C	09/09/2010	Offshore	1	NO	NO	14	NO	NO
LW03-SD549-00-10C	09/09/2010	Offshore	1	NO	NO	29	NO	NO
LW03-SD550-00-10C	09/08/2010	Offshore	0.67	NO	NO	14.4	NO	NO

**TABLE D-19**

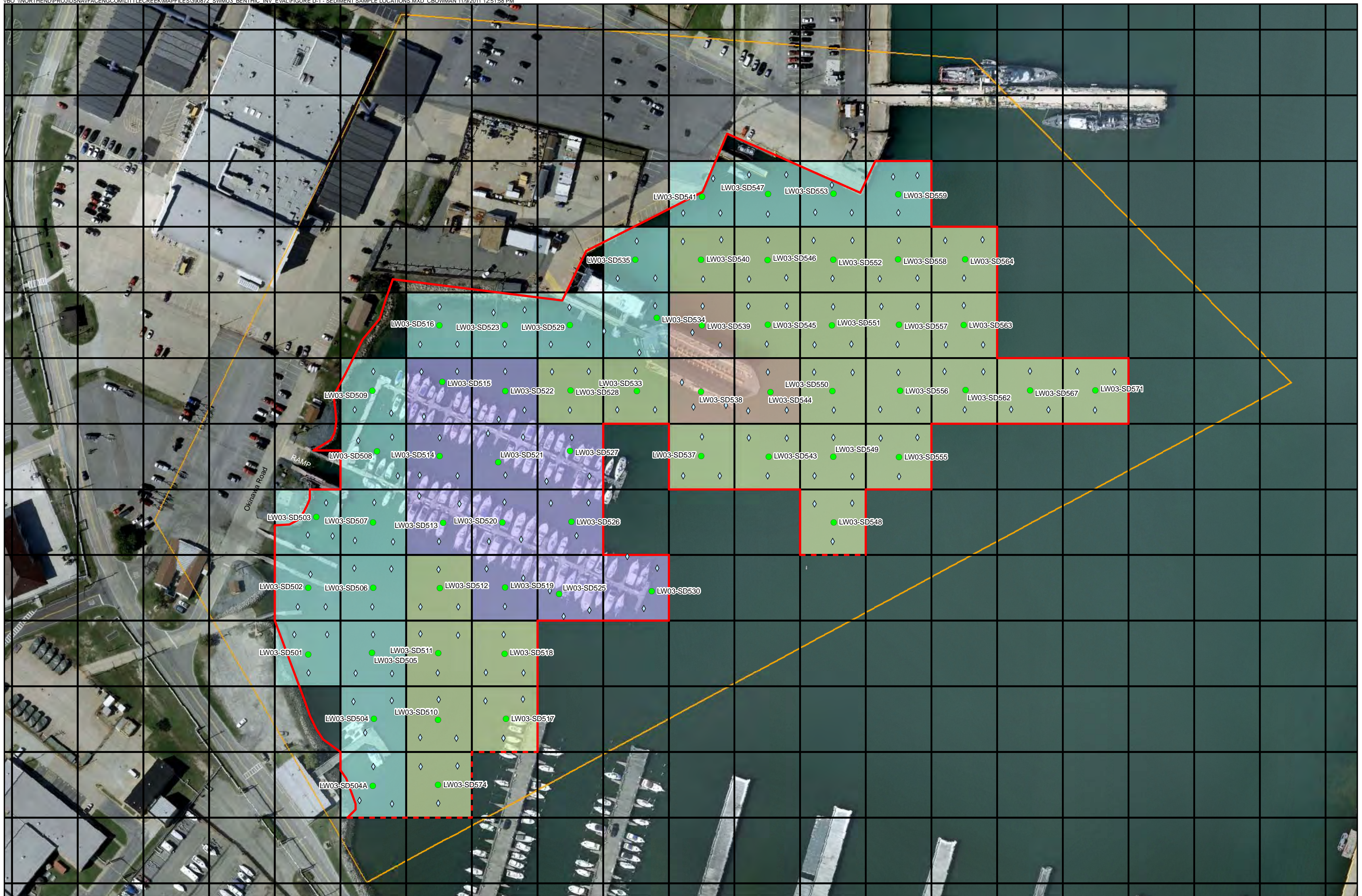
Benthic Invertebrate Metric Values (2010) for the SWMU 7B Connector Channel and SWMU 3

SWMU 3 Benthic Invertebrate Evaluation

*Joint Expeditionary Base Little Creek, Virginia Beach, Virginia*

Sample	Date	Area	Number of Taxa	Exceeds Channel Minimum?	Exceeds Channel Mean?	Total Density	Exceeds Channel Minimum?	Exceeds Channel Mean?
LW03-SD551-00-10C	09/08/2010	Offshore	3	NO	NO	43	NO	NO
LW03-SD552-00-10C	09/07/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD555-00-10C	09/09/2010	Offshore	2	NO	NO	187	NO	NO
LW03-SD556-00-10C	09/08/2010	Offshore	4	NO	NO	101	NO	NO
LW03-SD557-00-10C	09/08/2010	Offshore	3	NO	NO	43	NO	NO
LW03-SD558-00-10C	09/08/2010	Offshore	1.0	NO	NO	14.4	NO	NO
LW03-SD562-00-10C	09/08/2010	Offshore	1	NO	NO	14	NO	NO
LW03-SD563-00-10C	09/08/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD564-00-10C	09/08/2010	Offshore	2	NO	NO	29	NO	NO
LW03-SD567-00-10C	09/08/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD571-00-10C	09/08/2010	Offshore	0	NO	NO	0	NO	NO
LW03-SD574-00-10C	08/31/2010	Offshore	0	NO	NO	0	NO	NO





- Legend**
- 2010 Surface Water Quality Sample Locations
  - ◇ 2010 Composite Surface Sediment Sample Locations
  - SWMU 3 Boundary
  - 2009 Preliminary Impacted Sediment Lateral Boundary (dashed where inferred)

- Dry Dock Area
- Marina
- Near Shore
- Off Shore

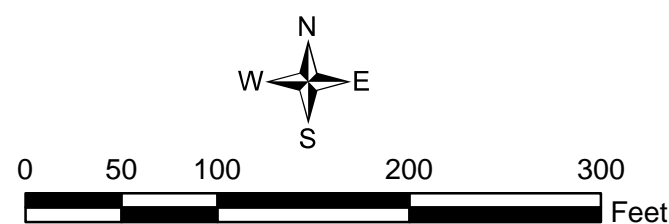
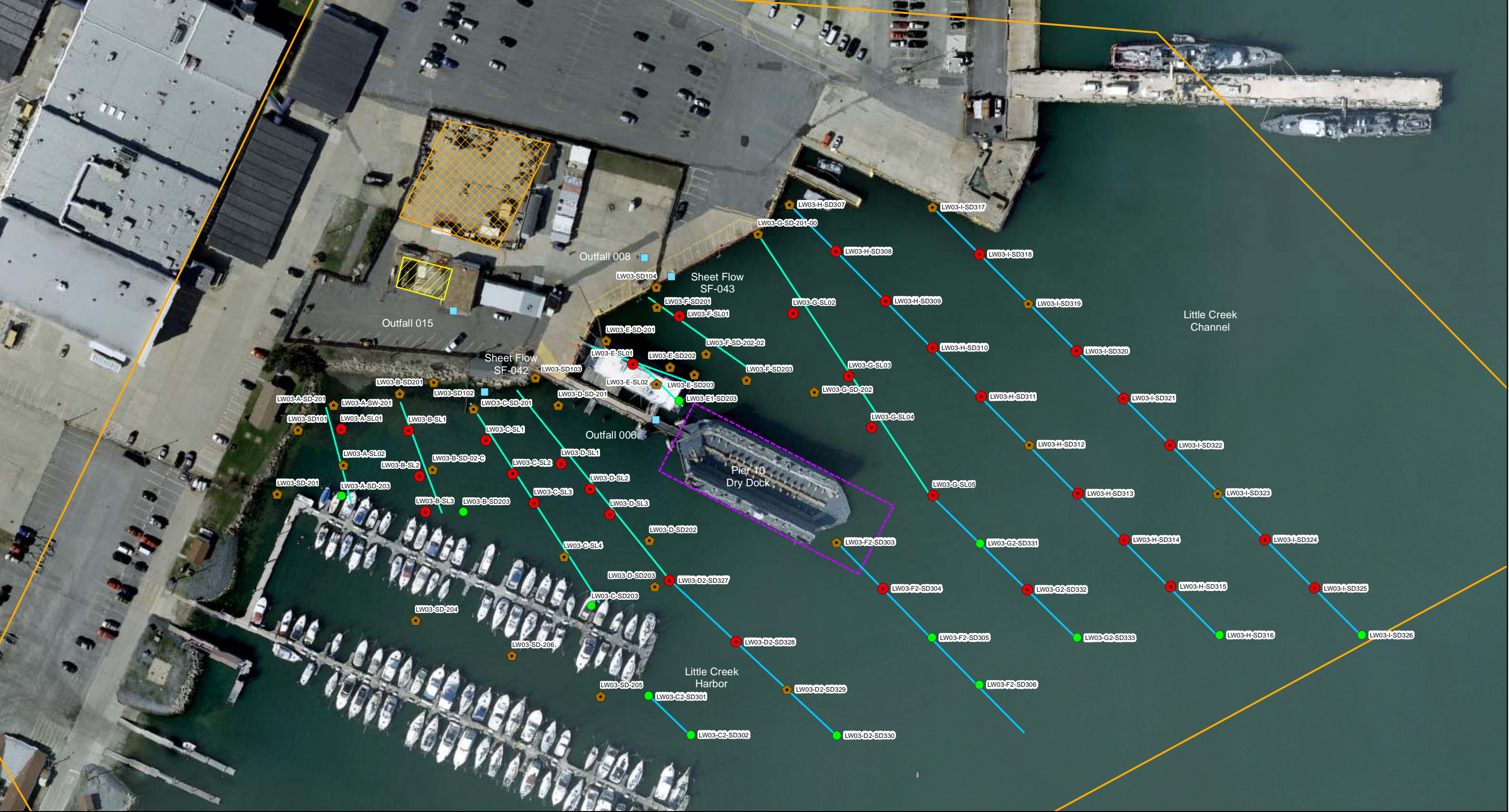


Figure D-1  
Sample Locations  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia





- Legend**
- ABM Screening Location
  - Surface Sediment Sampling Location
  - Surface/Subsurface Sampling Location
  - 2002 RI Transects
  - 2007 SRI Transects
  - Former Sandblasting Area (1962-1995)
  - More Recent Sandblasting Area (1995-1996)

- Dredging Limits
- SWMU 3 Boundary

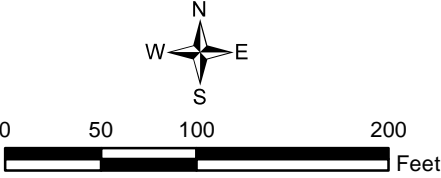


Figure D-2  
SI, RI, and SRI Sample Locations  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia





# Legend

- SWMU3 Boundary
- Installation Boundary

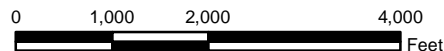
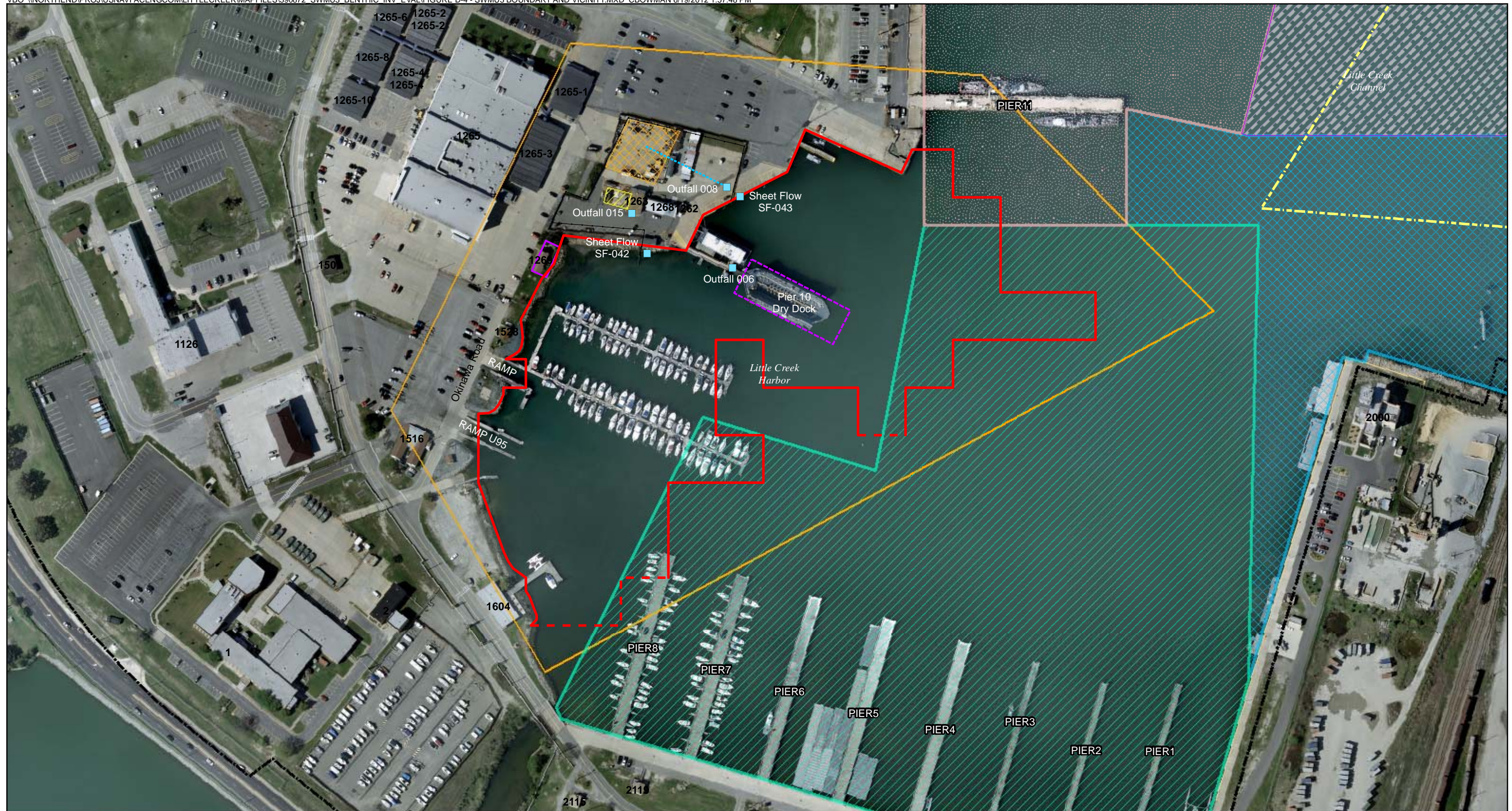


Figure D-3  
JEB Little Creek and SWMU 3 Location  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia





#### Legend

- Outfall Locations
- Underground Drain Pipe
- ▨ Area Dredged in 2010
- ▨ 1999 Dredging Limits
- Fenced Area
- ▬ 2009 Preliminary Impacted Sediment Lateral Boundary (dashed where inferred)
- ▬ Picnic Area
- ▬ SWMU 3 Investigation Boundary
- ▨ Former Sandblasting Area (1962-1995)
- ▨ More Recent Sandblasting Area (1995-1996)
- ▨ NAB Little Creek Dredge Maintenance to -18' mean low water (mlw)
- ▨ NAB Little Creek Dredge Maintenance to -20' mlw
- ▨ NAB Little Creek Dredge Maintenance to -25' mlw
- ▨ USACE Dredge Maintenance to -27' mlw

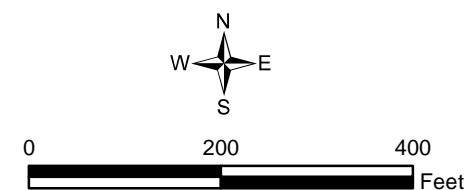
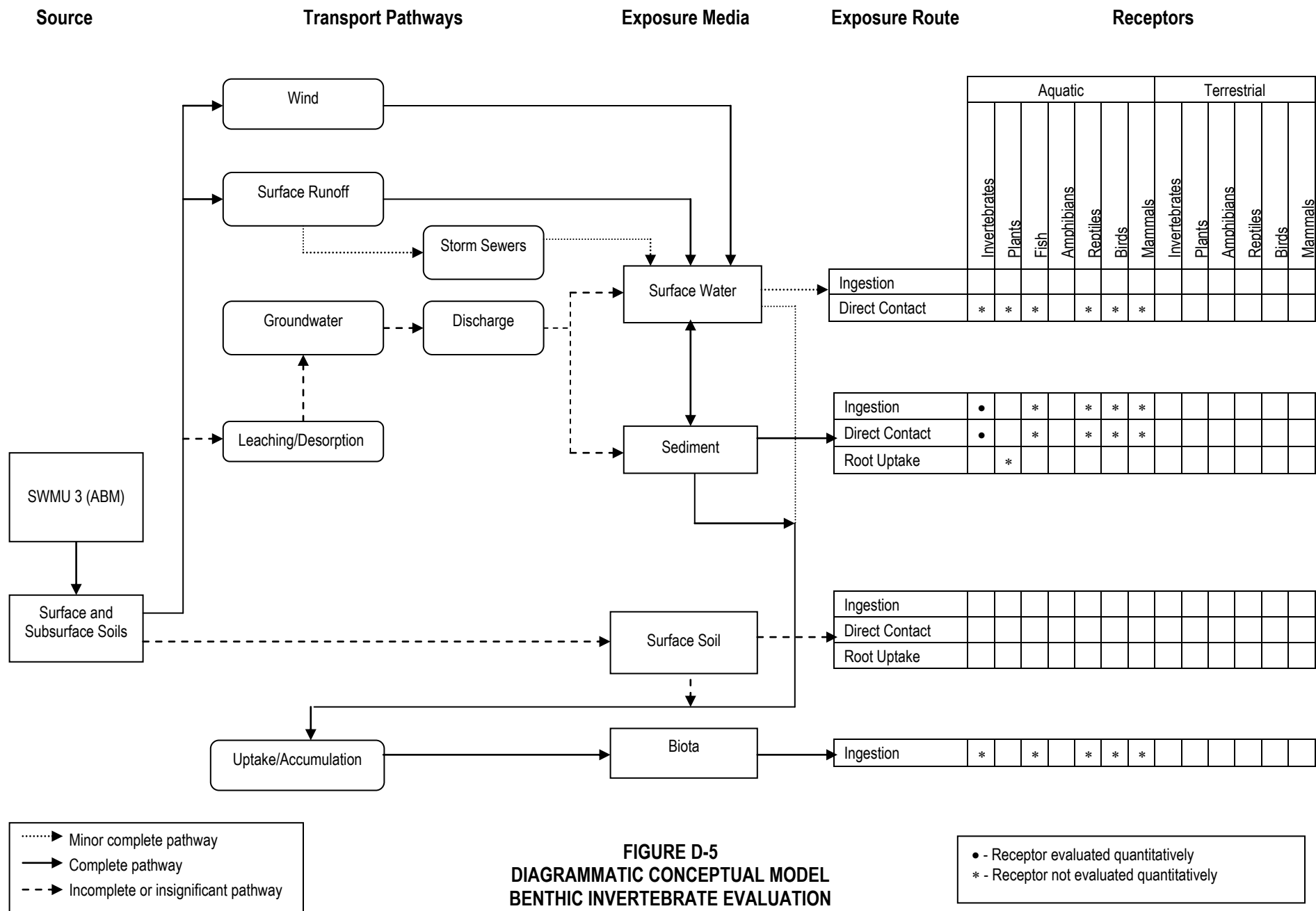


Figure D-4  
SWMU 3 Boundary and Immediate Vicinity  
Benthic Invertebrate Evaluation  
SWMU 3 – Pier 10 Sandblast Yard  
JEB Little Creek  
Virginia Beach, Virginia





**FIGURE D-5**  
**DIAGRAMMATIC CONCEPTUAL MODEL**  
**BENTHIC INVERTEBRATE EVALUATION**  
**JEB LITTLE CREEK, VIRGINIA BEACH, VIRGINIA**

Figure D-6. Number of Taxa Correlation Plots

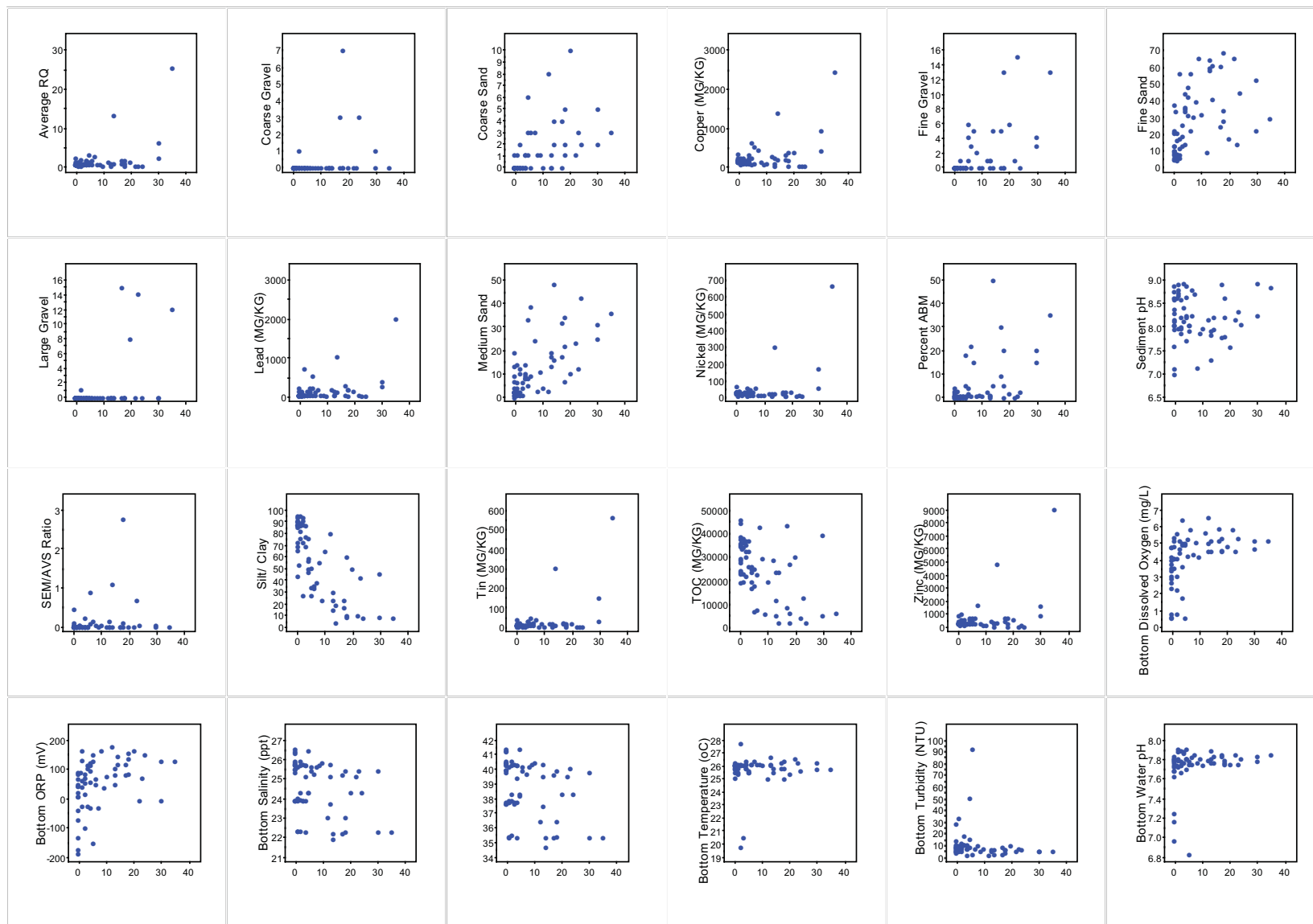


Figure D-6. Number of Taxa Correlation Plots

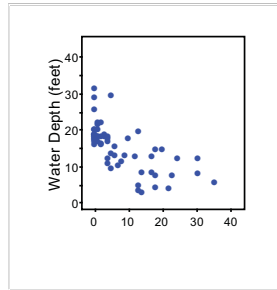


Figure D-6. Total Density (Number per Square Meter) Correlation Plots

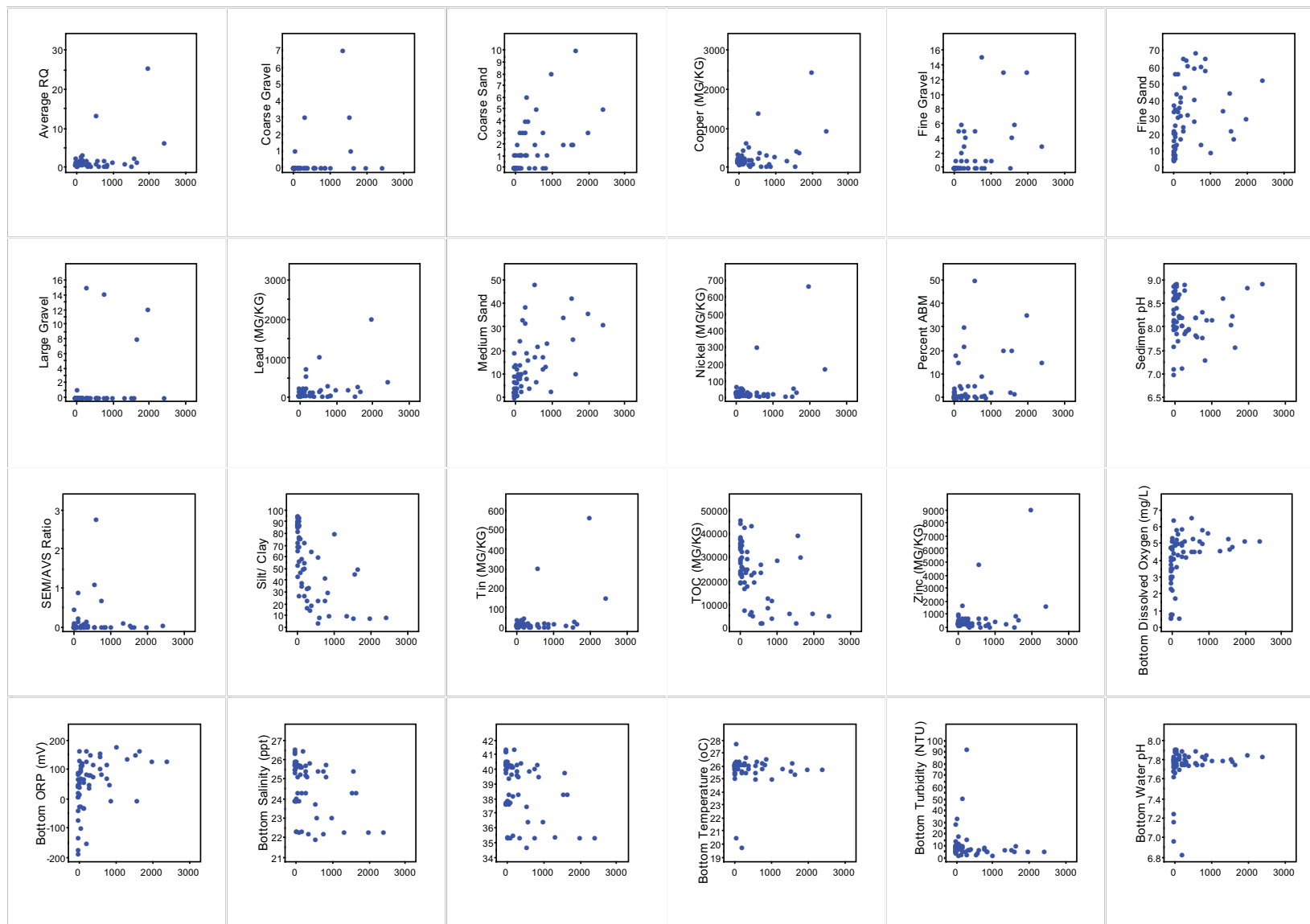
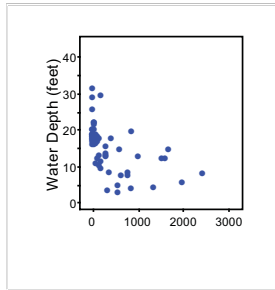




Figure D-6. Total Density (Number per Square Meter) Correlation Plots



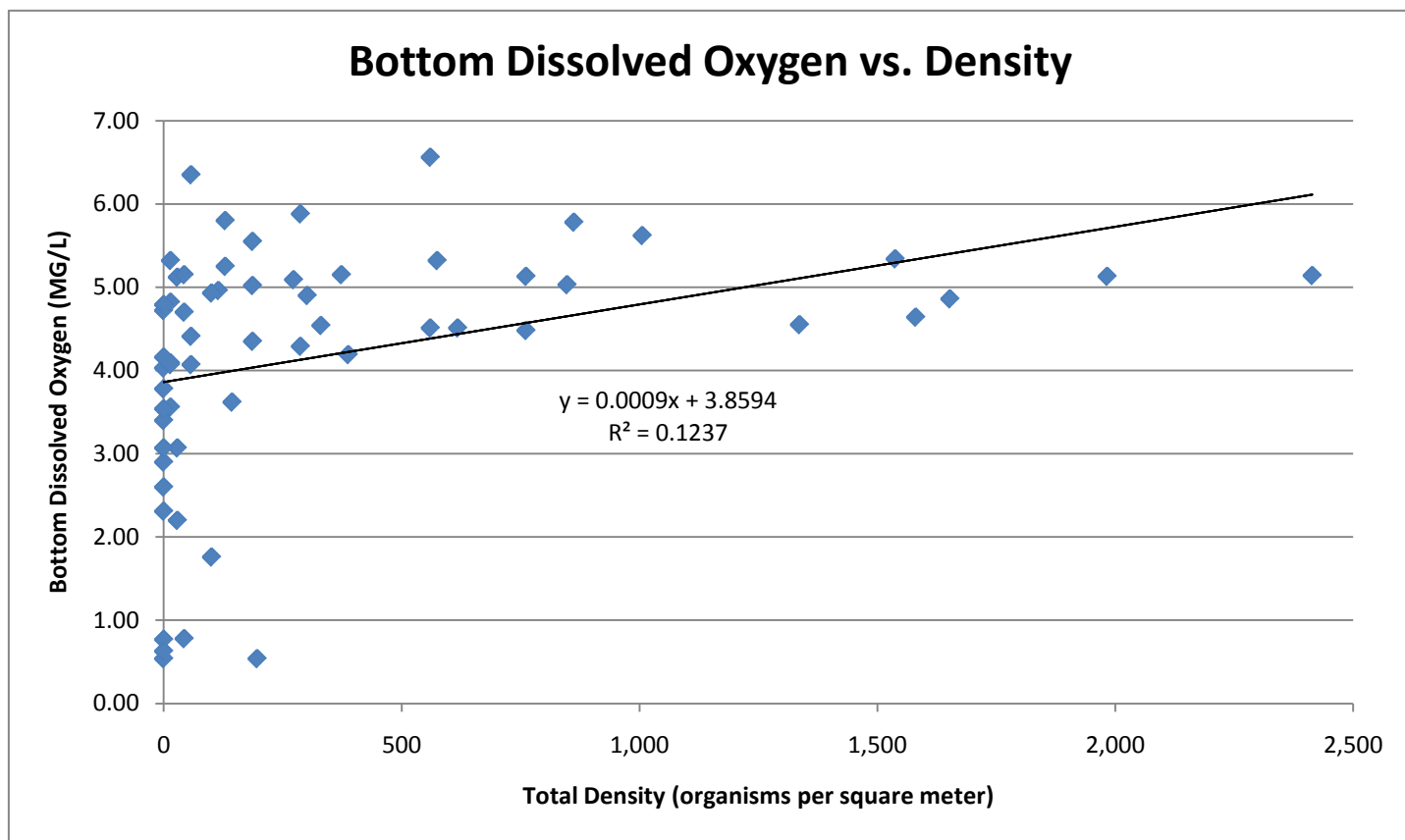


Figure D-7. SWMU 3 - 2010 - Bottom Dissolved Oxygen versus Total Density

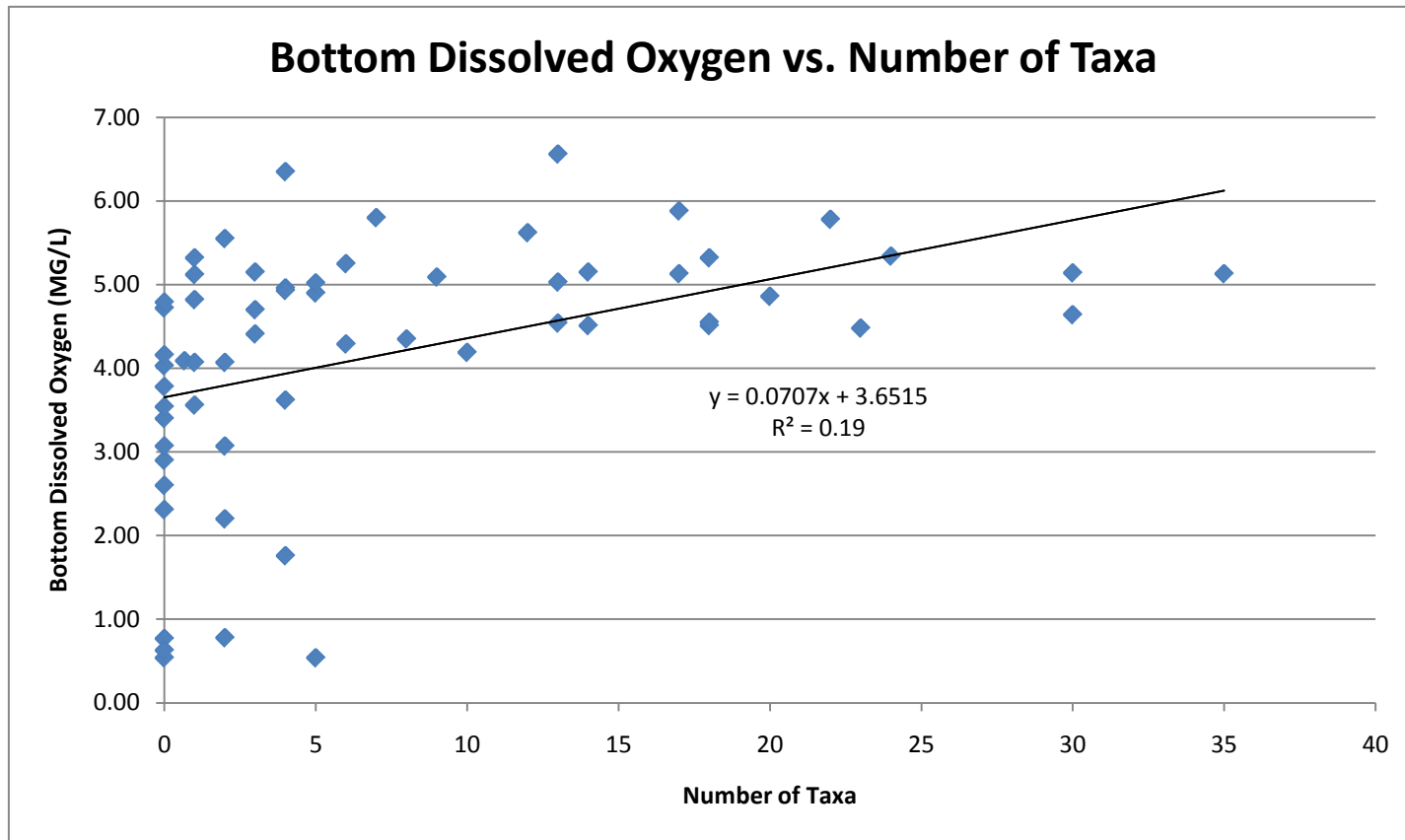


Figure D-8. SWMU 3 - 2010 - Bottom Dissolved Oxygen versus Number of Taxa

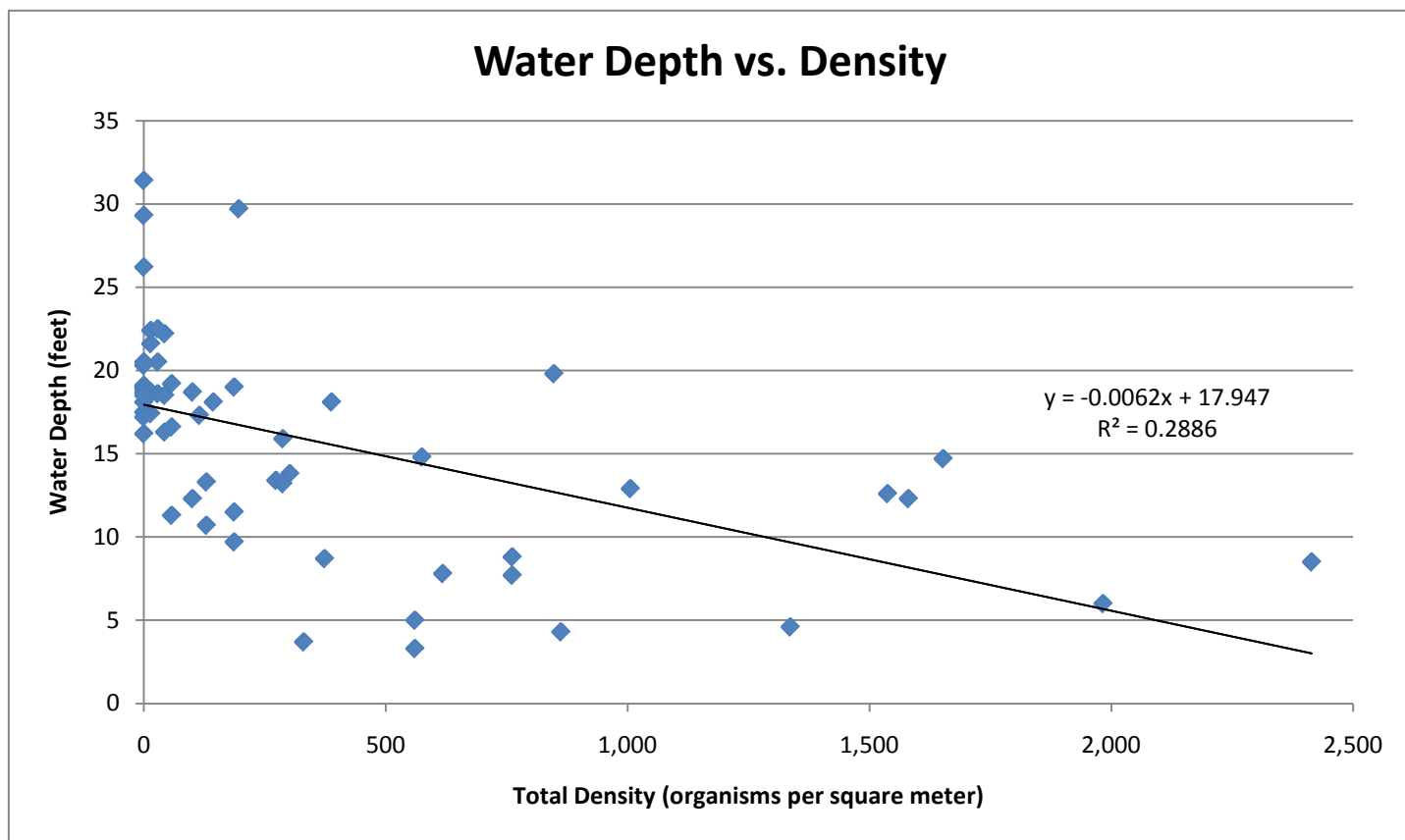
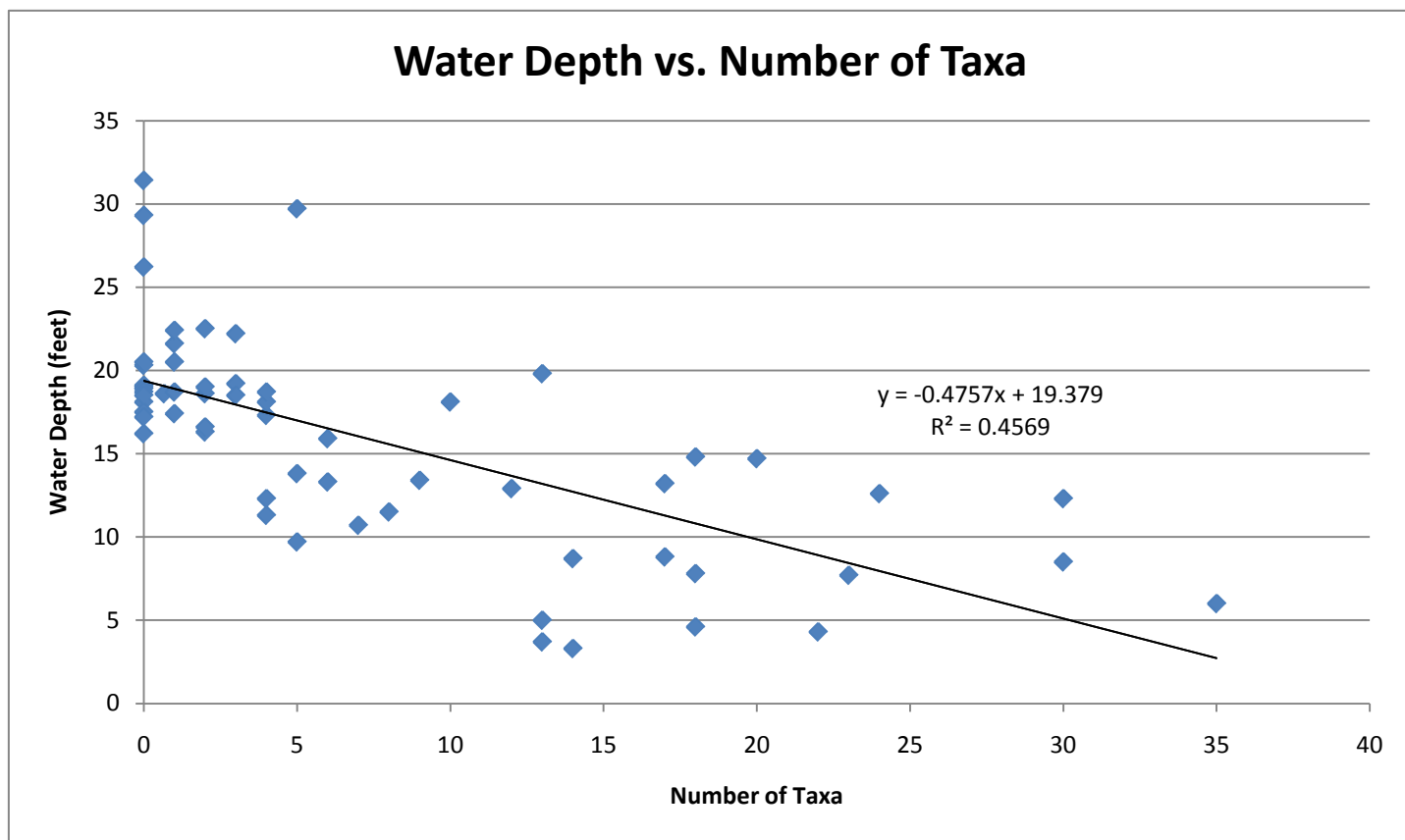


Figure D-9. SWMU 3 - 2010 - Water Depth versus Total Density



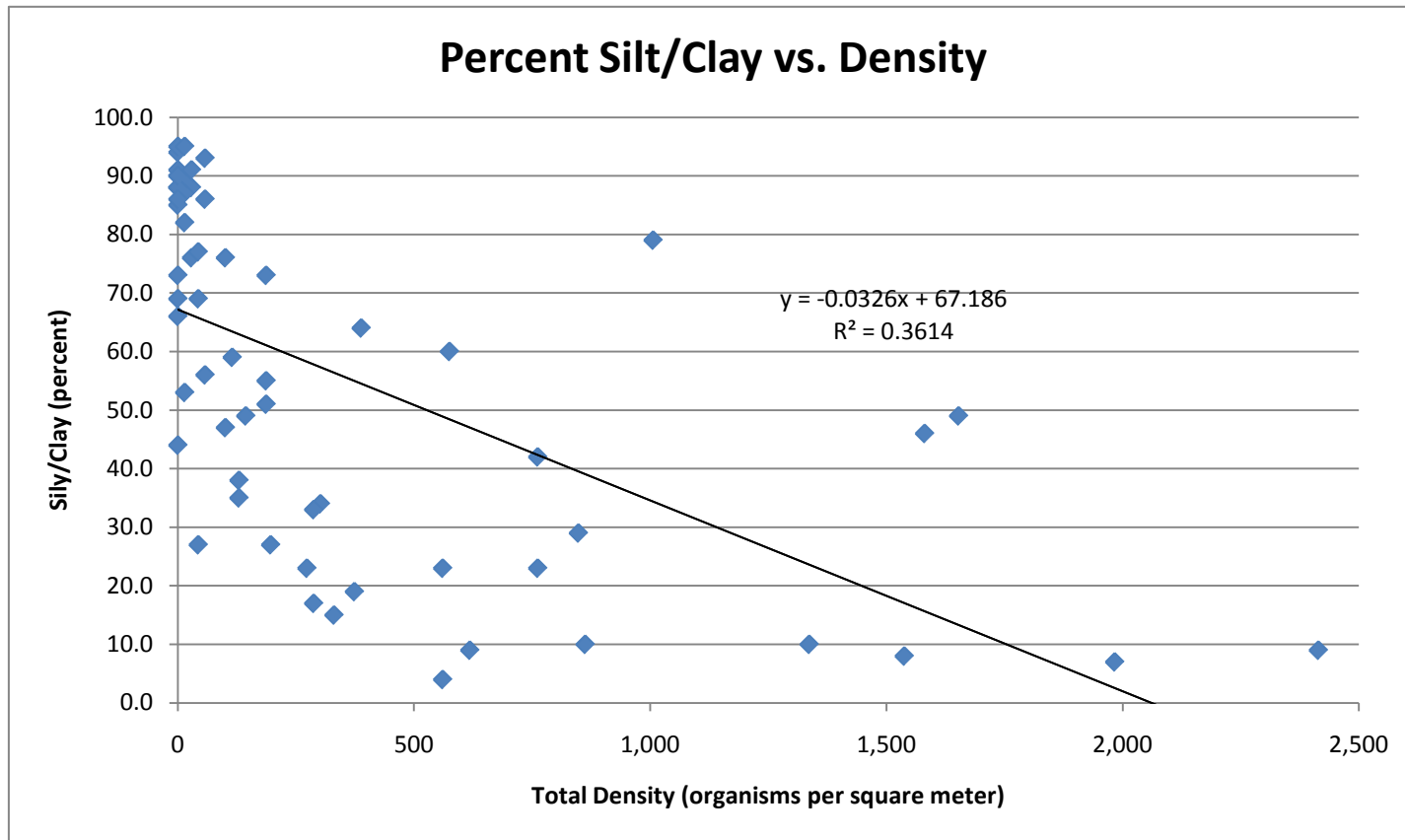


Figure D-11. SWMU 3 - 2010 - Percent Silt/Clay versus Total Density

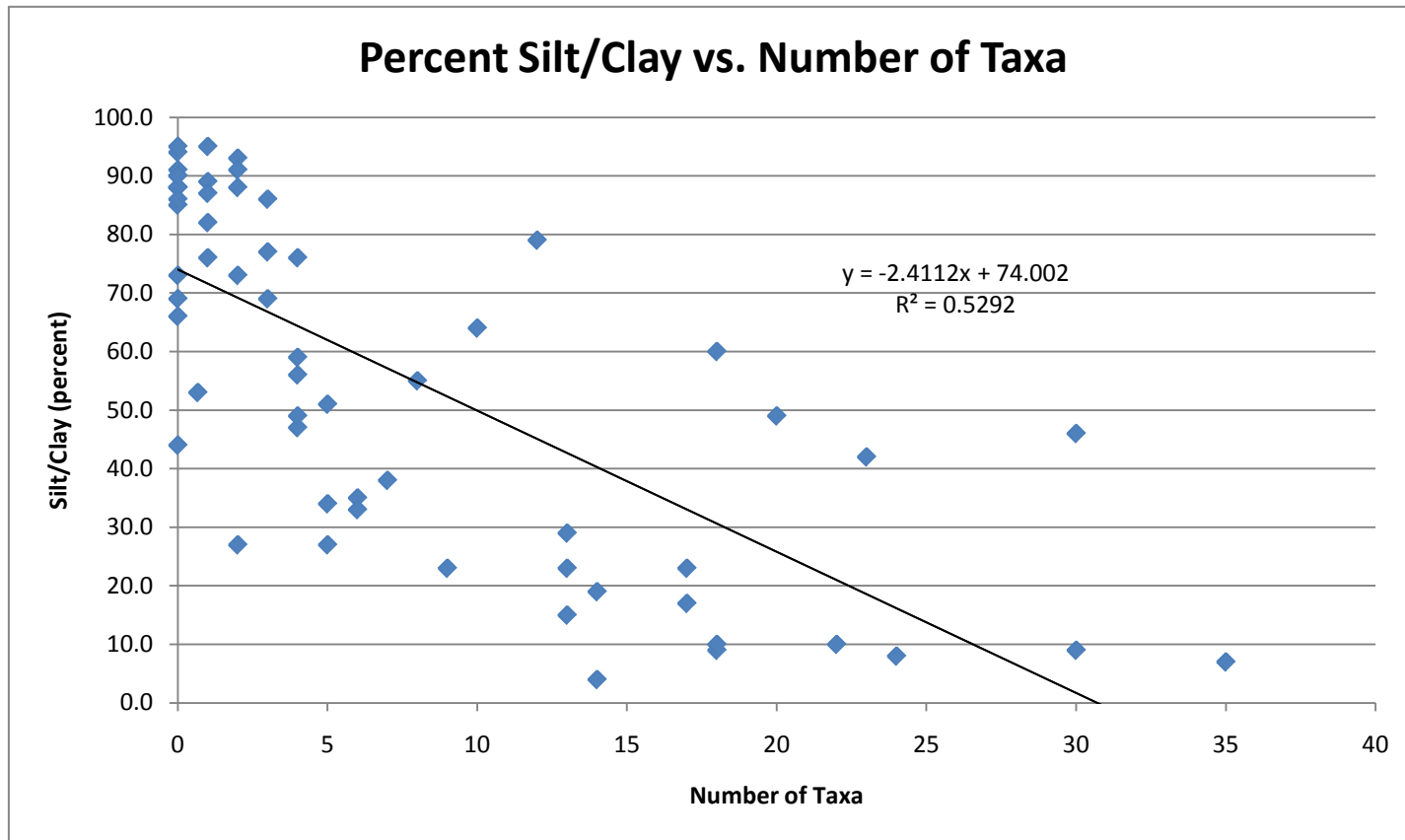


Figure D-12. SWMU 3 - 2010 - Percent Silt/Clay versus Number of Taxa

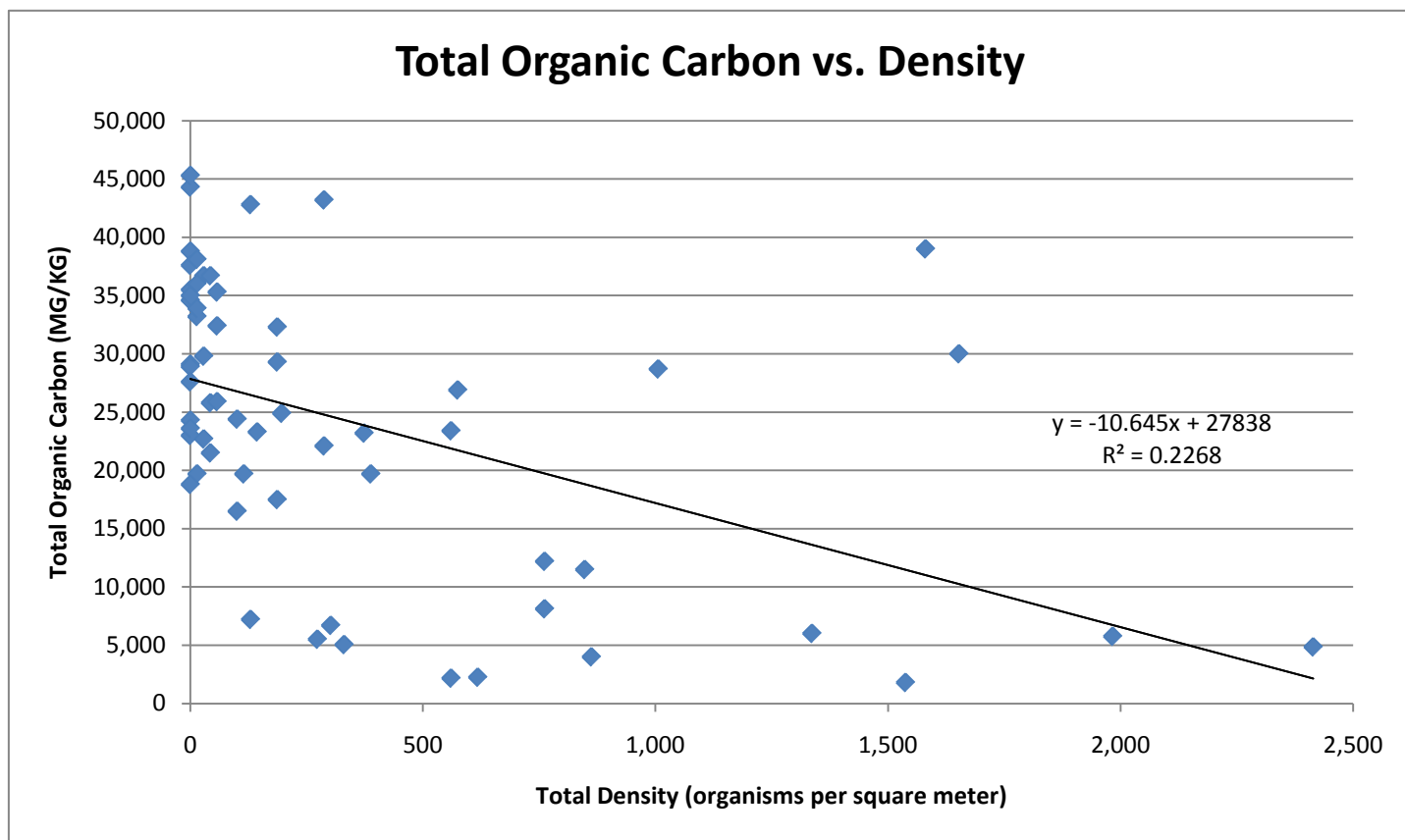


Figure D-13. SWMU 3 - 2010 - Total Organic Carbon versus Total Density



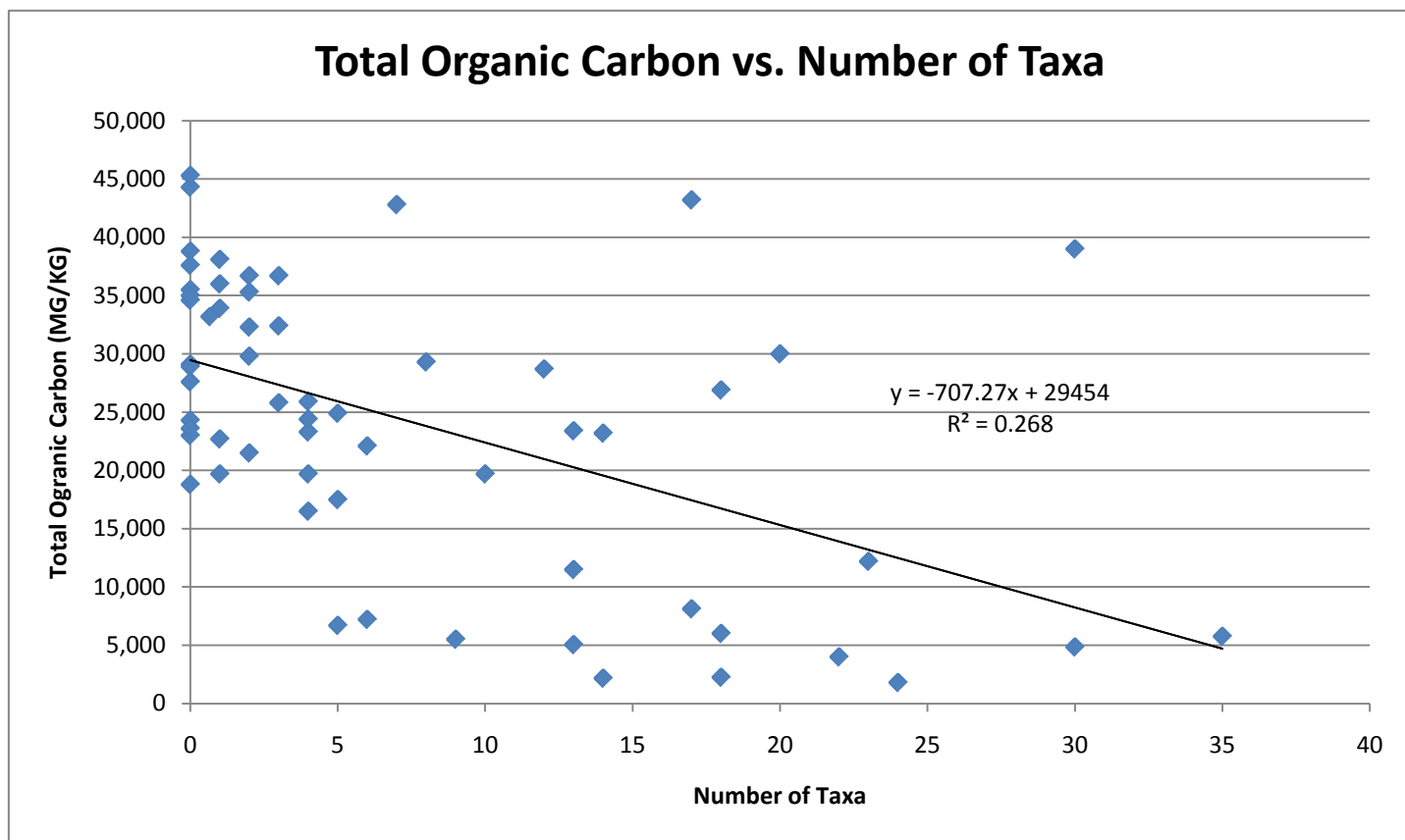


Figure D-14. SWMU 3 - 2010 - Total Organic Carbon versus Number of Taxa

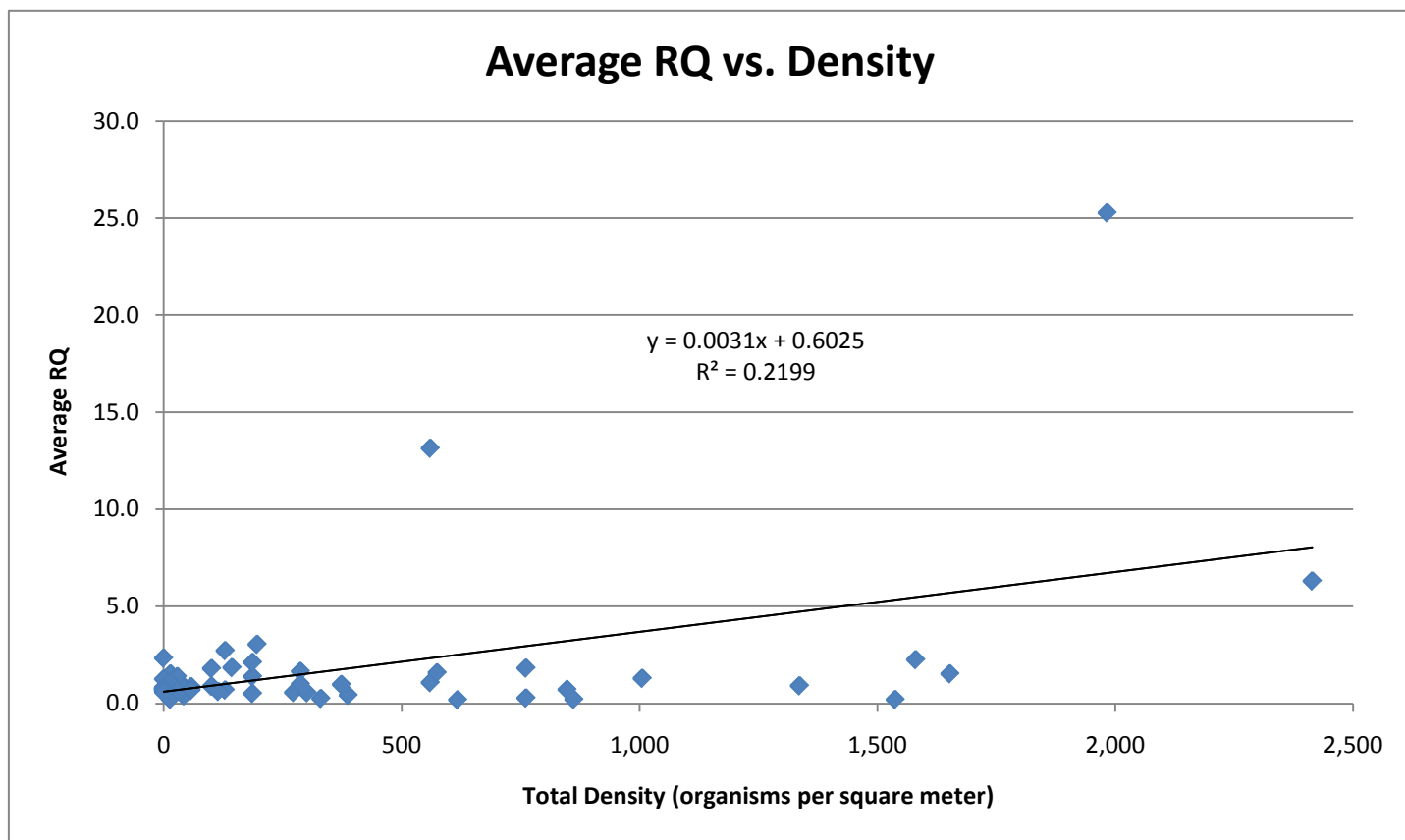


Figure D-15. SWMU 3 - 2010 - Average RQ versus Total Density

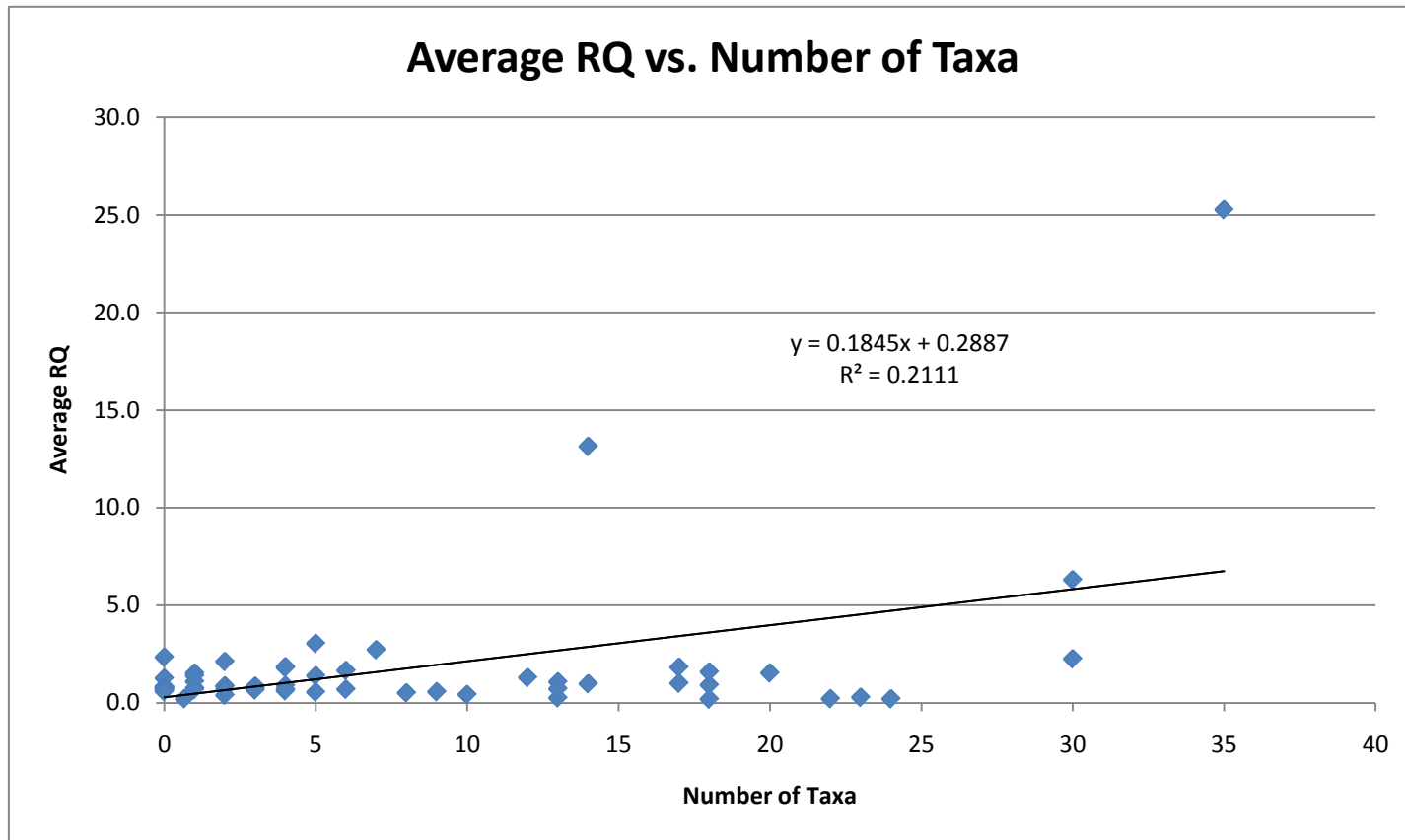


Figure D-16. SWMU 3 - 2010 - Average RQ versus Number of Taxa

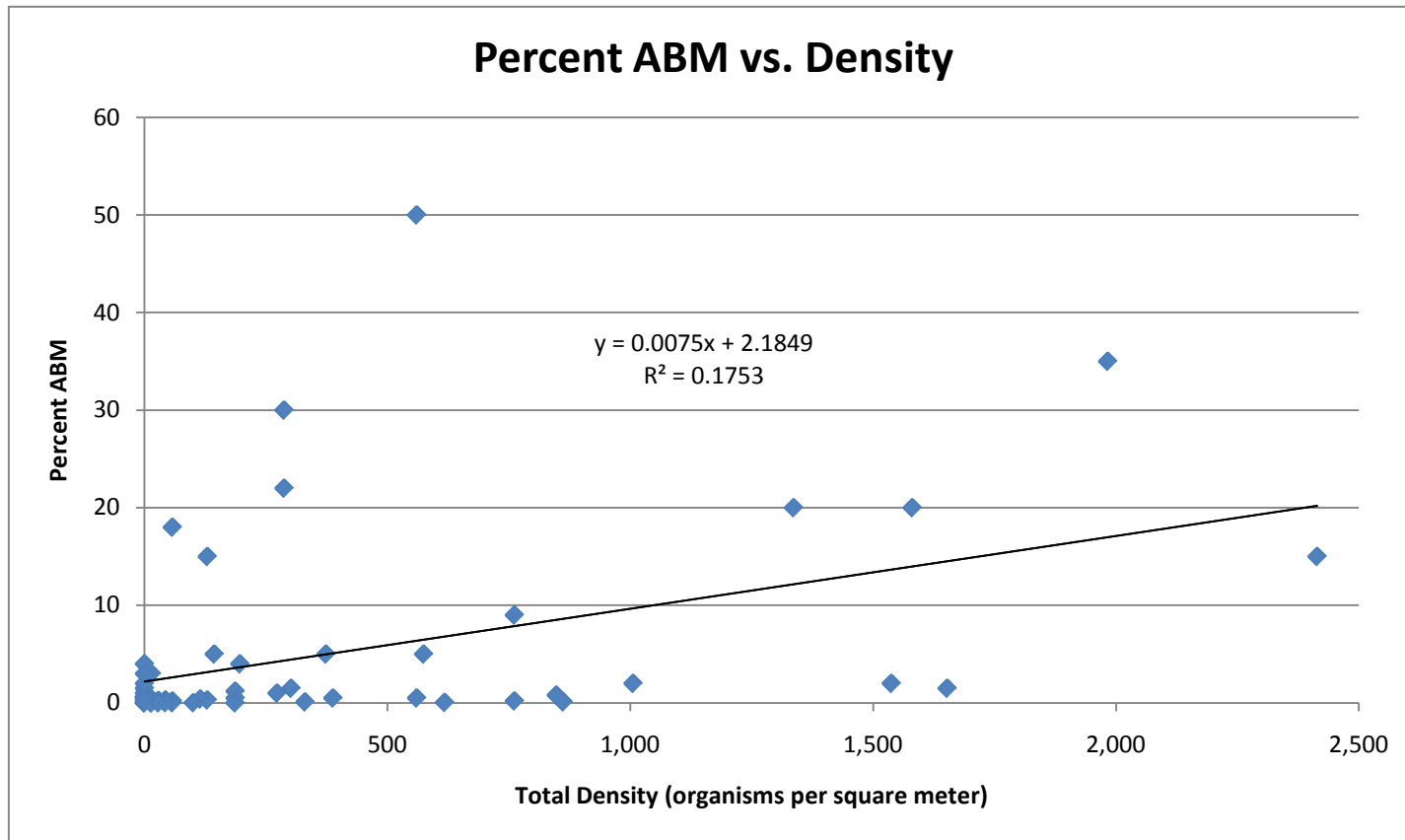


Figure D-17. SWMU 3 - 2010 - Percent ABM versus Total Density

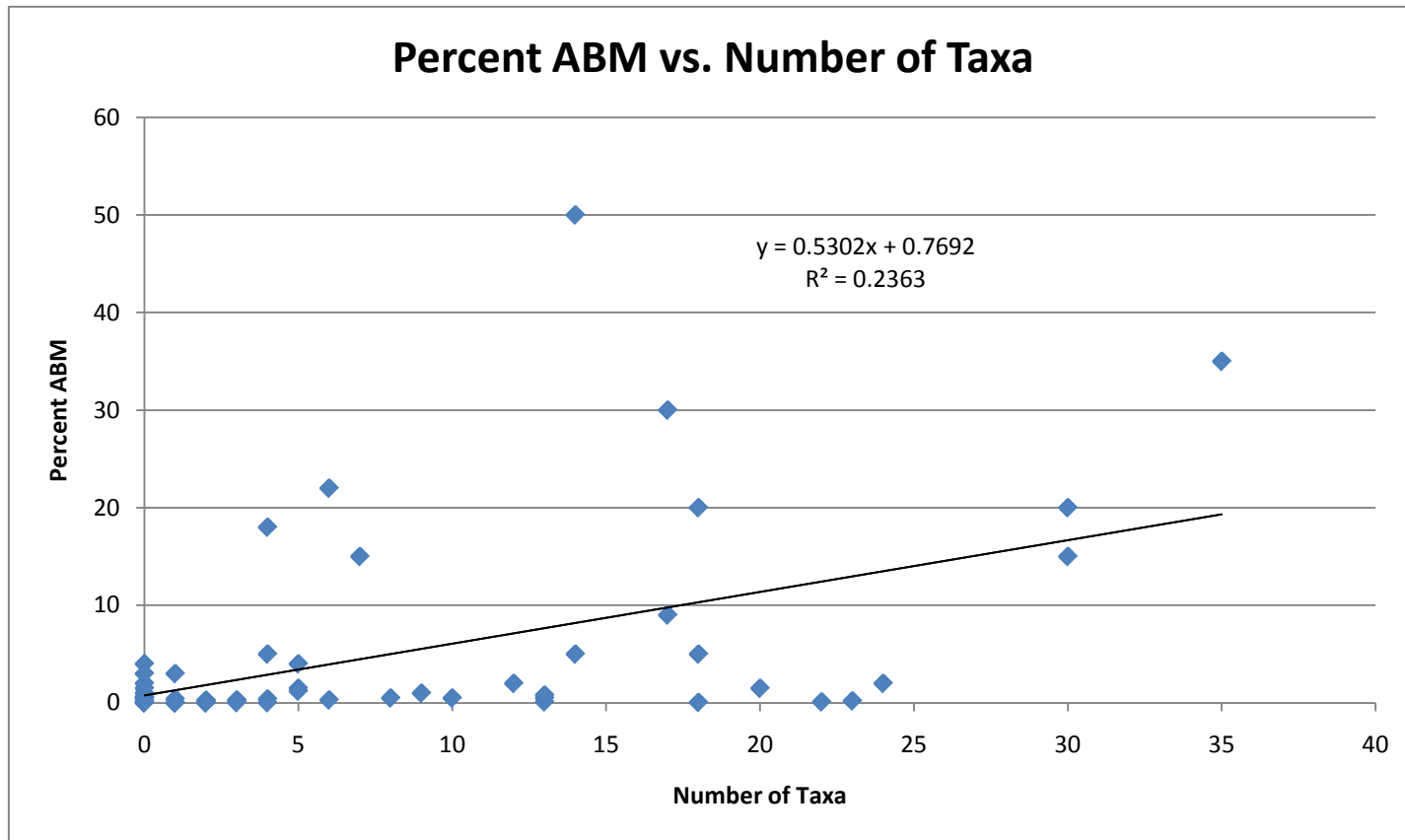


Figure D-18. SWMU 3 - 2010 - Percent ABM versus Number of Taxa

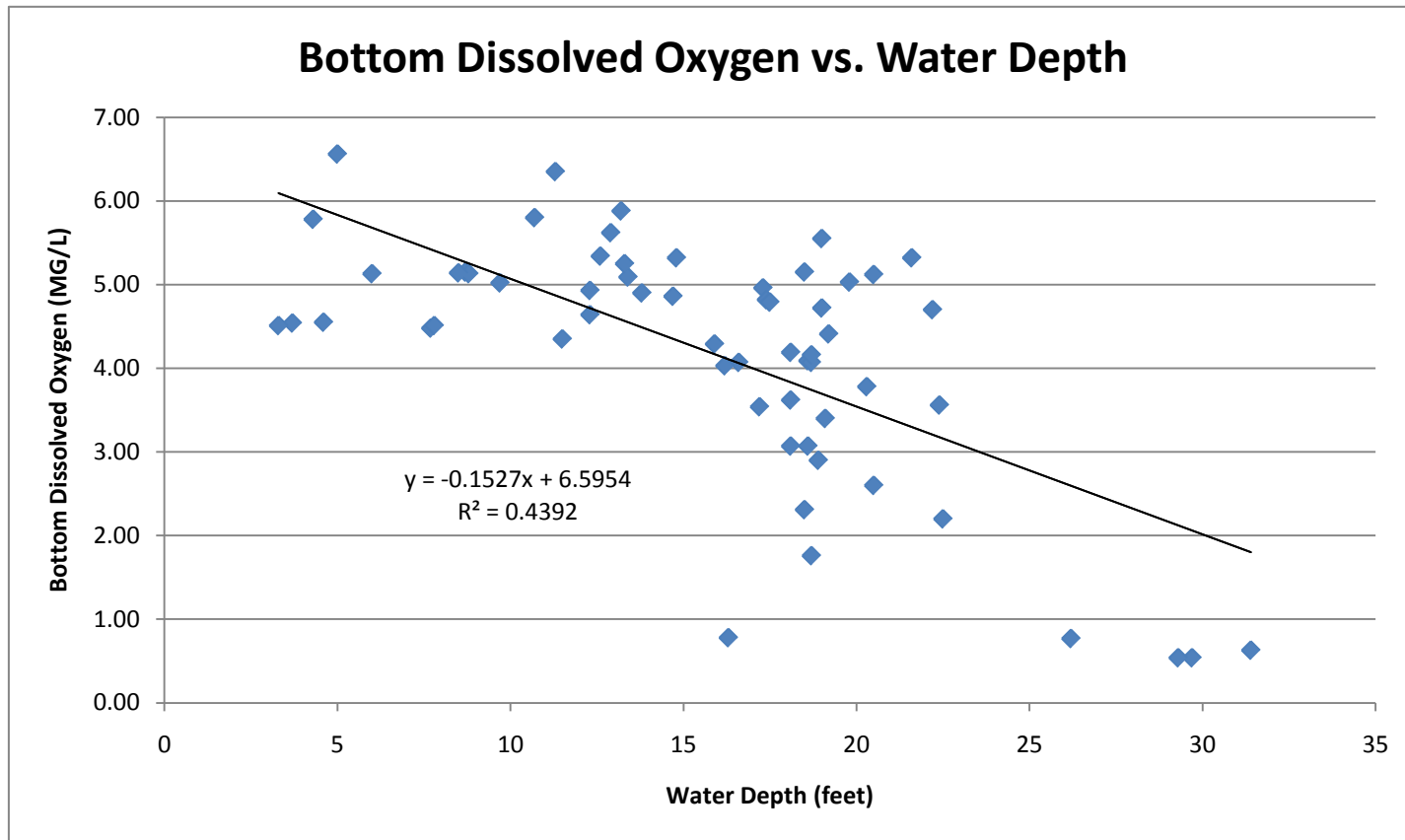


Figure D-19. SWMU 3 - 2010 - Bottom Dissolved Oxygen versus Water Depth

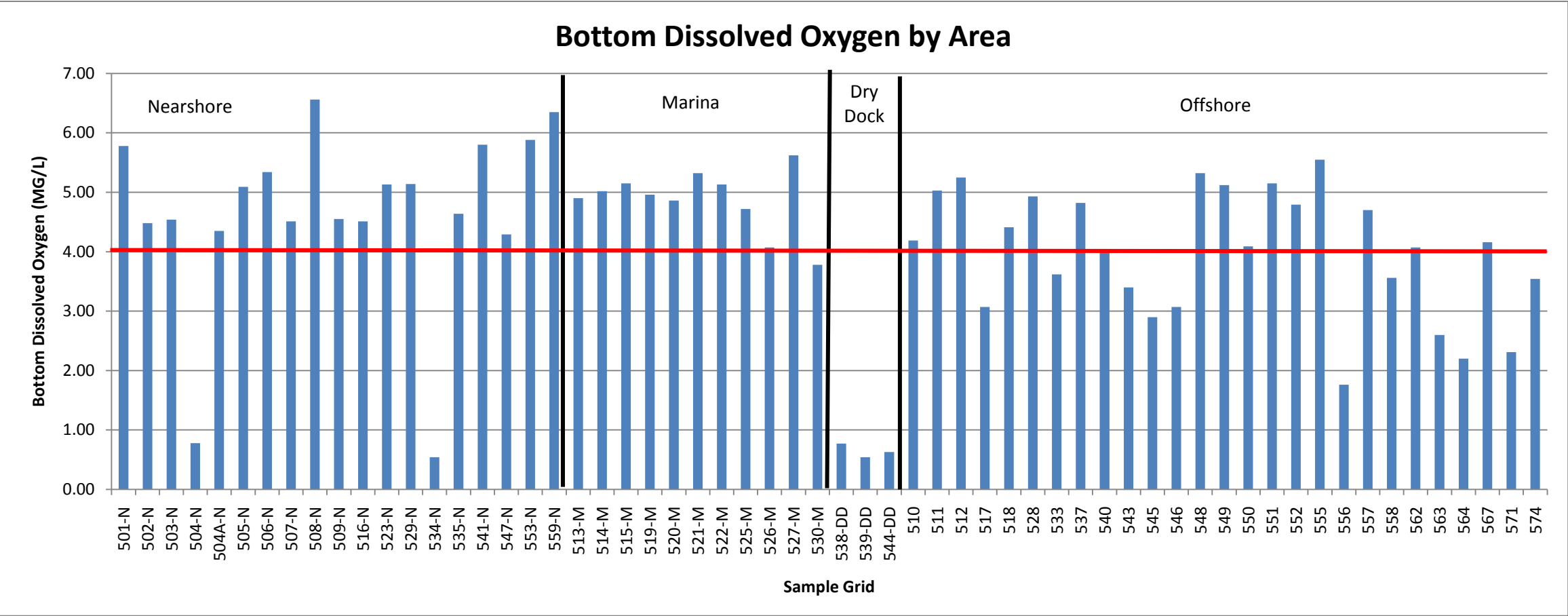


Figure D-20. SWMU 3 - 2010 - Bottom Dissolved Oxygen by Area

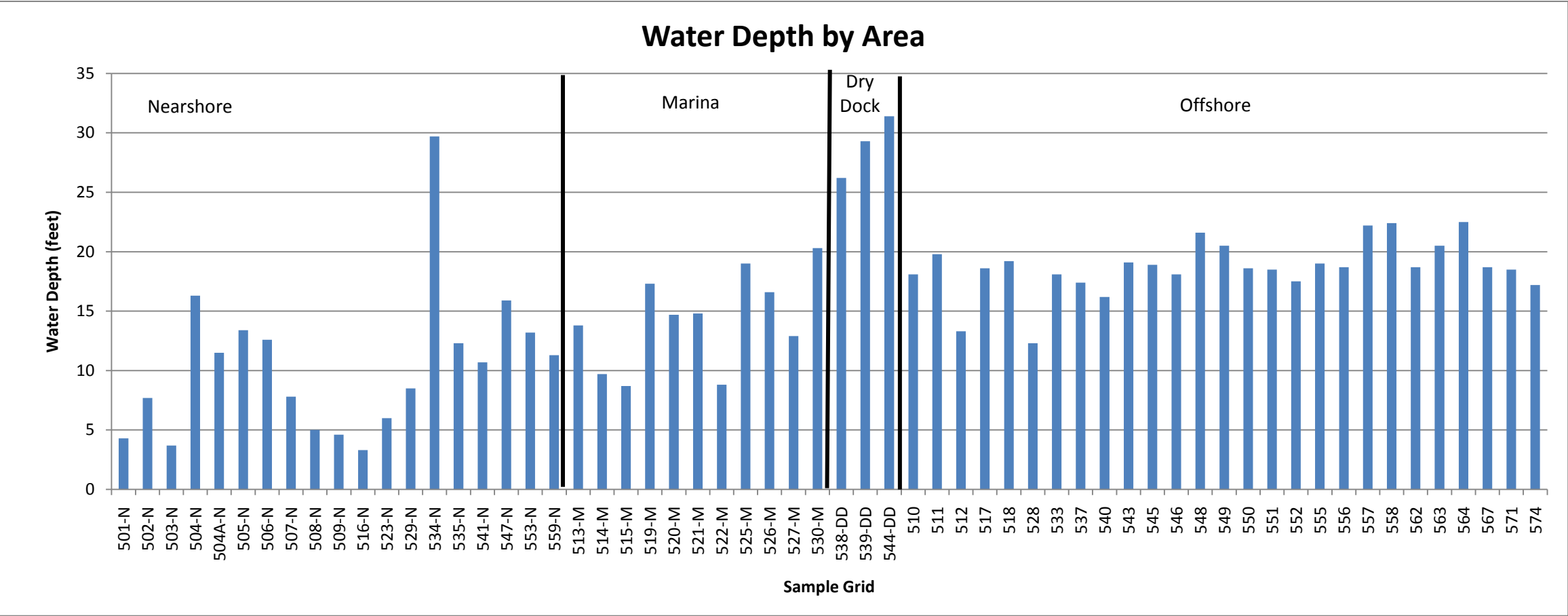


Figure D-21. SWMU 3 - 2010 - Water Depth by Area



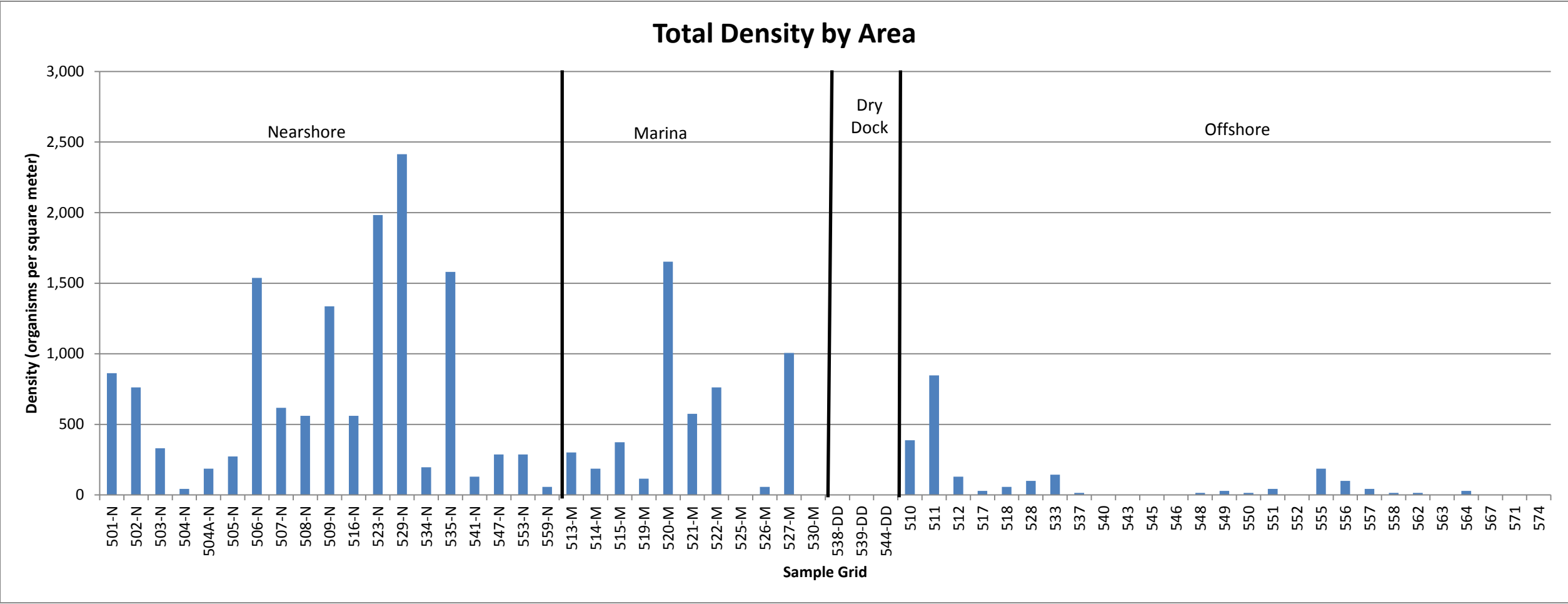


Figure D-22. SWMU 3 - 2010 - Total Density by Area

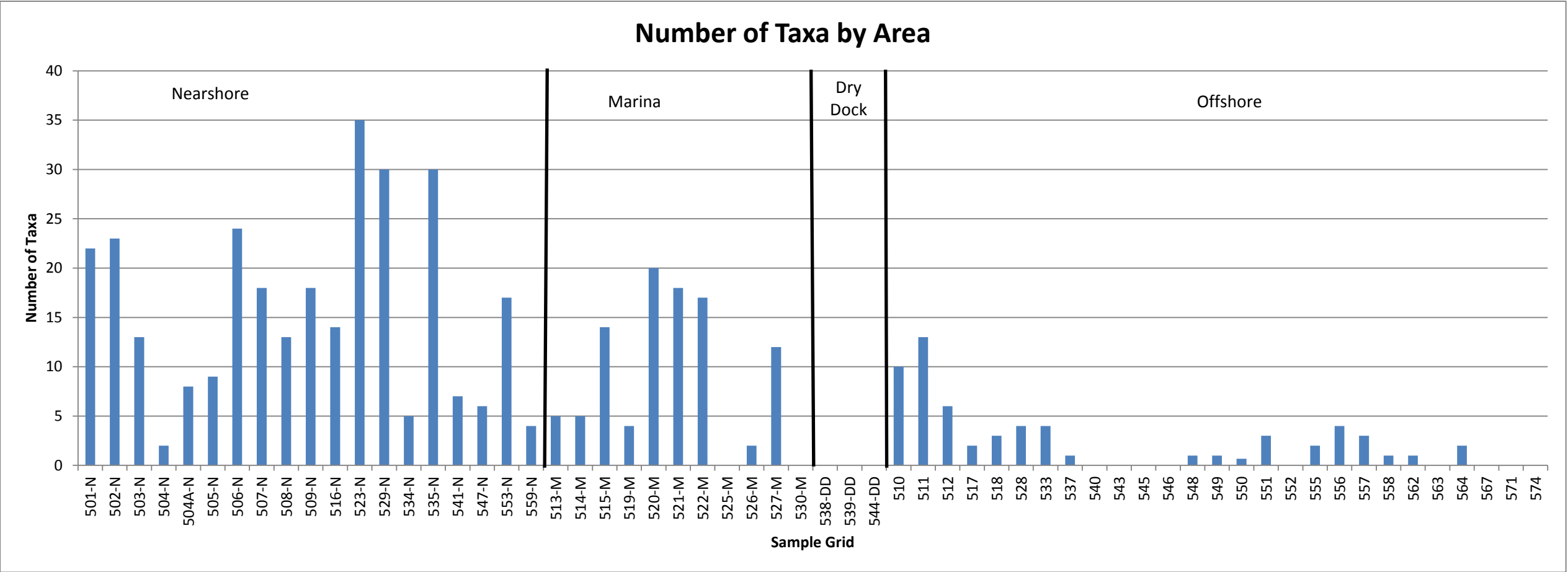


Figure D-23. SWMU 3 - 2010 - Number of Taxa by Area